User's Manual

AXF
Magnetic Flowmeter
Integral Flowmeter
Remote Flowtube
[Hardware Edition]

ADMAG AXF™

IM 01R20D01-01E-E

vigilantplant.™

YOKOGAWA

IM 01R20D01-01E-E
3rd Edition, Nov. 2006

Contents

1. INTRODUCTION 1-1
1.1 Using the Magnetic Flowmeter Safely 1-2
1.2 Warranty 1-3
1.3 Combination Remote Converters 1-3
1.4 ATEX Documentation 1-4

2. HANDLING PRECAUTIONS 2-1
2.1 Checking Model and Specifications 2-1
2.2 Accessories 2-1
2.3 Storage Precautions 2-2
2.4 Installation Location Precautions 2-2

3. INSTALLATION 3-1
3.1 Piping Design Precautions 3-1
3.2 Handling Precautions 3-3
3.2.1 General Precautions 3-3
3.2.2 Flowmeter Piping 3-4
3.3 Mounting Procedures 3-4
3.3.1 Nominal Diameter 2.5 mm (0.1 in.) to 10 mm (0.4 in.), Union Joint Style 3-4
3.3.2 Nominal Diameter 2.5 mm (0.1 in.) to 40 mm (1.5 in.), Wafer Style 3-6
3.3.3 Nominal Diameter 50 mm (2.0 in.) to 300 mm (12.0 in.), Wafer Style 3-10
3.3.4 Nominal Diameter 2.5 mm (0.1 in.) to 400 mm (16 in.), Flange Style 3-15
3.3.5 Sanitary Style 3-19

4. WIRING 4-1
4.1 Wiring the Integral Flowmeter 4-1
4.1.1 Wiring Precautions 4-1
4.1.2 Power Cable/Output Cable 4-1
4.1.3 Wiring Ports 4-2
4.1.4 Wiring Connections 4-3
4.2 Wiring the Remote Flowtube 4-8
4.2.1 Wiring Precautions 4-8
4.2.2 Cables 4-9
4.2.3 Wiring Ports 4-10
4.2.4 Wiring Connections 4-11

All Rights Reserved, Copyright © 2003, Yokogawa ElectricCorporation

5. MAINTENANCE 5-1
5.1 Changing Direction of Electrical Connection 5-1
5.2 Removing, Cleaning, and Installing Replaceable Electrodes (General Purpose Use Type Only).....5-2
5.2.1 Removing Replaceable Electrodes 5-2
5.2.2 Cleaning Replaceable Electrodes 5-3
5.2.3 Installing Replaceable Electrodes 5-4
5.3 Removing and Installing Adapters for Sanitary Style 5-5
5.4 Components Replacement (Integral Flowmeter Only) 5-6
5.4.1 Fuse Replacement 5-6
5.4.2 Display Unit Replacement 5-7
5.4.3 Amplifier Replacement 5-8
5.5 Setting of Switches (Integral Flowmeter Only) 5-9
5.5.1 Setting of Burnout Switch 5-9
5.5.2 Setting of Write Protect Switch 5-9
5.6 Regular Inspection Items 5-10
5.7 Excitation Coil and Insulation Resistance Check (Remote Flowtube Only) 5-10
5.8 Troubleshooting 5-11
5.8.1 No Indication 5-11
5.8.2 Unstable Zero 5-12
5.8.3 Disagreement Between Indication and Actual Flow 5-13
6. OUTLINE 6-1
7. PED (PRESSURE EQUIPMENT DIRECTIVE) 7-1
8. HAZARDOUS DUTY TYPE INSTRUMENT 8-1
8.1 ATEX (KEMA) 8-1
8.2 FM 8-3
8.3 CSA.....8-4
8.4 IECEx.....8-6

1. INTRODUCTION

This instrument has been adjusted at the factory before shipment.

To ensure correct use of the instrument, please read this manual thoroughly and fully understand how to operate the instrument before operating it.

NOTE

This manual describes the hardware configuration of integral flowmeter and remote flowtube of the AXF magnetic flowmeters.

For details of the “basic operating procedures”, “parameter description”, “operation via BRAIN terminal (BT200)”, “operation via HART communicator”, and “actual operation” for the AXF integral flowmeter, see the user’s manual of the AXFA14 Remote Converter [Hardware Edition / Software Edition] (IM 01R20C02-01E-E).
For FOUNDATION Fieldbus protocol (Output Signal and Communication suffix code "F") please refer to IM 01E20F02-01E.

Regarding This User’s Manual

- This manual should be provided to the end user.
- Before use, read this manual thoroughly to comprehend its contents.
- The contents of this manual may be changed without prior notice.
- All rights are reserved. No part of this manual may be reproduced in any form without Yokogawa's written permission.
- Yokogawa makes no warranty of any kind with regard to this material, including, but not limited to, implied warranties of merchantability and suitability for a particular purpose.
- All reasonable effort has been made to ensure the accuracy of the contents of this manual. However, if any errors or omissions are found, please inform Yokogawa.
- Yokogawa assumes no responsibilities for this product except as stated in the warranty.
- Please note that this user's manual may not be revised for any specification changes, construction changes or operating part changes that are not considered to affect function or performance.
- If the customer or any third party is harmed by the use of this product, Yokogawa assumes no responsibility for any such harm owing to any defects in the product which were not predictable, or for any indirect damages.

NOTE

For details of the AXFA11G magnetic flowmeter converter, see the IM 01R20C01-01E-E instruction manual. For details on the AXFA14G/C magnetic flowmeter converter, see the IM01R20C02-01E-E instruction manual.

Safety and Modification Precautions

- The following general safety precautions must be observed during all phases of operation, service and repair of this instrument. Failure to comply with these precautions or with specific WARNINGS given elsewhere in this manual violates safety standards of design, manufacture and intended use of the instrument. Yokogawa assumes no liability for the customer's failure to comply with these requirements. If this instrument is used in a manner not specified in this manual, the protection provided by this instrument may be impaired.
- The following safety symbol marks are used in this user's manual and instrument.

WARNING

A WARNING sign denotes a hazard. It calls attention to procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury or death of personnel.

CAUTION

A CAUTION sign denotes a hazard. It calls attention to procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

IM 01R20D01-01E-E
3rd edition , Nov. 2006

IMPORTANT

An IMPORTANT sign denotes that attention is required to avoid damage to the instrument or system failure.

NOTE

A NOTE sign denotes information necessary for essential understanding of operation and features.

⏚ Protective grounding terminal

⏚ Functional grounding terminal
(This terminal should not be used as a protective grounding terminal.)

~ Alternating current

⎓ Direct current

1.1 Using the Magnetic Flowmeter Safely

WARNING

(1) Installation
- Installation of the magnetic flowmeter must be performed by expert engineers or skilled personnel. No operator shall be permitted to perform procedures relating to installation.
- The magnetic flowmeter is a heavy instrument. Be careful that no damage is caused to personnel through accidentally dropping it, or by exerting excessive force on the magnetic flowmeter. When moving the magnetic flowmeter, always use a trolley and have at least two people carry it.
- When the magnetic flowmeter is processing hot fluids, the instrument itself may become extremely hot. Take sufficient care not to get burnt.
- Where the fluid being processed is a toxic substance, avoid contact with the fluid and avoid inhaling any residual gas, even after the instrument has been taken off the line for maintenance and so forth.
- Do not apply excessive weight, for example a person stepping on the magnetic flowmeter.
- All procedures relating to installation must comply with the electrical code of the country where it is used.

(2) Wiring
- The wiring of the magnetic flowmeter must be performed by expert engineers or skilled personnel. No operator shall be permitted to perform procedures relating to wiring.
- When connecting the wiring, check that the supply voltage is within the range of the voltage specified for this instrument before connecting the power cable. In addition, check that no voltage is applied to the power cable before connecting the wiring.
- The protective grounding must be connected securely at the terminal with the ⏚ mark to avoid danger to personnel.

(3) Operation
- Do not open the cover until the power has been off for at least 10 min. Only expert engineers or skilled personnel are permitted to open the cover.

(4) Maintenance
- Maintenance on the magnetic flowmeter should be performed by expert engineers or skilled personnel. No operator shall be permitted to perform any operations relating to maintenance.
- Always conform to maintenance procedures outlined in this manual. If necessary, contact Yokogawa.
- Care should be taken to prevent the build up of dirt, dust or other substances on the display panel glass or data plate. If these surfaces get dirty, wipe them clean with a soft dry cloth.

(5) European Pressure Equipment Directive (PED)
- When using the instrument as a PED-compliant product, be sure to read Chapter 7 before use.

(6) Hazardous Duty Type Instruments
- Magnetic flowmeters with the model name AXF□□□C are products which have been certified as explosion proof type instruments. Strict limitations are applied to the structures, installation locations, external wiring work, maintenance and repairs etc. of these instruments. Sufficient care must be taken, as any violation of the limitations may cause dangerous situations. Be sure to read chapter 8 "HAZARDOUS DUTY TYPE INSTRUMENTS" before handling the instruments. The description in chapter 8 is prior to other description in this instruction manual.
- Only trained personal should install and maintain instruments in the industrial location.

•The protective grounding terminal ⏚ must be connected to a suitable IS grounding system.
•Take care not to generate mechanical sparks while working the instrument and peripherial devices in hazardous areas.

1.2 Warranty

- The terms of this instrument that are guaranteed are described in the quotation. We will make any repairs that may become necessary during the guaranteed term free of charge.
- Please contact our sales office if this instrument requires repair.
- If the instrument is faulty, contact us with concrete details about the problem and the length of time it has been faulty, and state the model and serial number. We would appreciate the inclusion of drawings or additional information.
- The results of our examination will determine whether the meter will be repaired free of charge or on an at-cost basis.

The guarantee will not apply in the following cases:

- Damage due to negligence or insufficient maintenance on the part of the customer.
- Problems or damage resulting from handling, operation or storage that violates the intended use and specifications.
- Problems that result from using or performing maintenance on the instrument in a location that does not comply with the installation location specified by Yokogawa.
- Problems or damage resulting from repairs or modifications not performed by Yokogawa or someone authorized by Yokogawa.
- Problems or damage resulting from inappropriate installation after delivery.
- Problems or damage resulting from disasters such as fires, earthquakes, storms, floods or lightning strikes and external causes.
- All instruction manuals for ATEX Ex related products are availabel in English, German and French. Should you require Ex related instructions in your local language, you should contact your nearest Yokogawa office or representative.

1.3 Combination Remote Converters

IMPORTANT

- The AXF remote flowtube (size 2.5 (0.1 in.) to 400 mm (16 in.) should be used in combination with one of the following converters:
  - AXFA11 remote converter
  - AXFA14 remote converter

  Contact Yokogawa before using it in combination with converters other than those listed above.
- If the converter combined with the AXF magnetic flowmeter's remote flowtube is changed from the AXFA11 to AXFA14 or vice versa, the meter factor of the remote flowtube must be readjusted according to its flow calibration.

IM 01R20D01-01E-E
3rd edition , Nov. 2006

1.4 ATEX Documentation

This procedure is only applicable to the countries in European Union.

GB

All instruction manuals for ATEX Ex related products are available in English, German and French. Should you require Ex related instructions in your local language, you are to contact your nearest Yokogawa office or representative.

DK

Alle brugervejledninger for produkter relateret til ATEX Ex er tilgængelige på engelsk, tysk og fransk. Skulle De ønske yderligere oplysninger om håndtering af Ex produkter på eget sprog, kan De rette henvendelse herom til den nærmeste Yokogawa afdeling eller forhandler.

I

Tutti i manuali operativi di prodotti ATEX contrassegnati con Ex sono disponibili in inglese, tedesco e francese. Se si desidera ricevere i manuali operativi di prodotti Ex in lingua locale, mettersi in contatto con l'ufficio Yokogawa più vicino o con un rappresentante.

E

Todos los manuales de instrucciones para los productos antiexplosivos de ATEX están disponibles en inglés, alemán y francés. Si desea solicitar las instrucciones de estos artículos antiexplosivos en su idioma local, deberá ponerse en contacto con la oficina o el representante de Yokogawa más cercano.

NL

Alle handleidingen voor producten die te maken hebben met ATEX explosiebeveiliging (Ex) zijn verkrijgbaar in het Engels, Duits en Frans. Neem, indien u aanwijzingen op het gebied van explosiebeveiliging nodig hebt in uw eigen taal, contact op met de dichtstbijzijnde vestiging van Yokogawa of met een vertegenwoordiger.

SF

Kaikkien ATEX Ex -tyyppisten tuotteiden käyttöhjeet ovat saatavilla englannin-, saksan- ja ranskankielisinä. Mikäli tarvitsette Ex -tyyppisten tuotteiden ohjeita omalla paikallisella kielellännne, ottakaa yhteyttä lähimpään Yokogawa-toimistoon tai -edustajaan.

P

Todos os manuais de instruções referentes aos produtos Ex da ATEX estão disponíveis em Inglês, Alemão e Francês. Se necessitar de instruções na sua língua relacionadas com produtos Ex, deverá entrar em contacto com a delegação mais próxima ou com um representante da Yokogawa.

F

Tous les manuels d'instruction des produits ATEX Ex sont disponibles en langue anglaise, allemande et française. Si vous nécessitez des instructions relatives aux produits Ex dans votre langue, veuillez bien contacter votre représentant Yokogawa le plus proche.

D

Alle Betriebsanleitungen für ATEX Ex bezogene Produkte stehen in den Sprachen Englisch, Deutsch und Französisch zur Verfügung. Sollten Sie die Betriebsanleitungen für Ex-Produkte in Ihrer Landessprache benötigen, setzen Sie sich bitte mit Ihrem örtlichen Yokogawa-Vertreter in Verbindung.

S

Alla instruktionsböcker för ATEX Ex (explosionssäkra) produkter är tillgängliga på engelska, tyska och franska. Om Ni behöver instruktioner för dessa explosionssäkra produkter på annat språk, skall Ni kontakta närmaste Yokogawakontor eller representant.

GR

Ολα τα εγχειριδια λειτουργιαζ τωυ προιουτ῝υ με ATEX Ex διατιΘευται στα Αγγλικα, Γερμαυικα και Γαλλικα. Σε περιπτωση που χρειαζεοτε οδηγιεζ σχετικα με Ex στηυ τοπικη γλωσσα παρακαλουμε επικοιυωυηστε με το πλησιεστερο γραφειο τηζ Yokogawa η αντιπροσωπο τηζ.

SK

Všetky návody na obsluhu pre prístroje s ATEX Ex sú k dispozícii v jazyku anglickom, nemeckom a francúzskom. V prípade potreby návodu pre Ex-prístroje vo Vašom národnom jazyku, skontaktujte prosím miestnu kanceláriu firmy Yokogawa.

CZ

Všechny uživatelské příručky pro výrobky, na něž se vztahuje nevýbušné schválení ATEX Ex, jsou dostupné v angličtině , němčině a francouzštině . Požadujete-li pokyny týkající se výrobků s nevýbušným schválením ve vašem lokálním jazyku, kontaktujte prosím vaši nejbližší reprezentační kancelář Yokogawa.

LT

Visos gaminiø ATEX Ex kategorijos Eksploatavimo instrukcijos teikiami anglø, vokieèiø ir prancûzø kalbomis. Norëdami gauti prietaisø Ex dokumentacijà kitomis kalbomis susisiekite su artimiausiu bendrovës “Yokogawa” biuru arba atstovu.

LV

Visas ATEX Ex kategorijas izstrâdâjumu Lietoðanas instrukcijas tiek piegâdâtas angïu, vâcu un franèu valodâs. Ja vçlaties saòemt Ex ierîèu dokumentâciju citâ valodâ, Jums ir jâsazinâs ar firmas Jokogava (Yokogawa) tuvâko ofisu vai pârstâvi.

EST

Kõik ATEX Ex toodete kasutamisjuhendid on esitatud inglise, saksa ja prantsuse keeles. Ex seadmete muukeelse dokumentatsiooni saamiseks pöörduge lähima lokagava (Yokogawa) kontori või esindaja poole.

PL

Wszystkie instrukcje obsługi dla urządzeń w wykonaniu przeciwwybuchowym Ex, zgodnych z wymaganiami ATEX, dostępne są w języku angielskim, niemieckim i francuskim. Jeżeli wymagana jest instrukcja obsługi w Państwa lokalnym ję zyku, prosimy o kontakt z najbliższym biurem Yokogawy.

SLO

Vsi predpisi in navodila za ATEX Ex sorodni pridelki so pri roki v angliščini, nemščini ter francoščini. Èe so Ex sorodna navodila potrebna v vašem tukejnjem jeziku, kontaktirajte vaš najbliši Yokogawa office ili predstaunika.

H

Az ATEX Ex mûszerek gépkönyveit angol, német és francia nyelven adjuk ki. Amennyiben helyi nyelven kérik az Ex eszközök leírásait, kérjük keressék fel a legközelebbi Yokogawa irodát, vagy képviseletet.

BG

Всички упътвания за продукти от серията ATEX Ex се предлагат на английски, немски и френски език. Ако се нуждаете от упътвания за продукти от серията Ex на родния ви език, се свържете с най-близкия офис или представителство на фирма Yokogawa.

RO

Toate manualele de instructiuni pentru produsele ATEX Ex sunt in limba engleza, germana si franceza. In cazul in care doriti instructiunile in limba locala, trebuie sa contactati cel mai apropiat birou sau reprezentant Yokogawa.

M

Il-manwali kollha ta’ l-istruzzjonijiet għal prodotti marbuta ma’ ATEX Ex huma disponibbli bl-Ingliż, bil-Ġermaniż u bil-Franċiż. Jekk tkun teħtieġ struzzjonijiet marbuta ma’ Ex fil-lingwa lokali tiegħek, għandek tikkuntattja lill-eqreb rappreżentan jew uffiċċju ta’ Yokogawa.

2. HANDLING PRECAUTIONS

This instrument has been inspected carefully at the factory before shipment. When the instrument is delivered, make a visual check that no damage has occurred during transportation.

Read this section carefully as it contains important information on handling this instrument. Refer to the relevant sections for information not contained in this section. If you have any problems or questions, please contact Yokogawa sales office.

2.1 Checking Model and Specifications

The model code and specifications are found on the data plate located on the outside of the case. Check that the model code and specifications match what you have ordered.

Be sure you have your model number and serial number available when contacting Yokogawa.

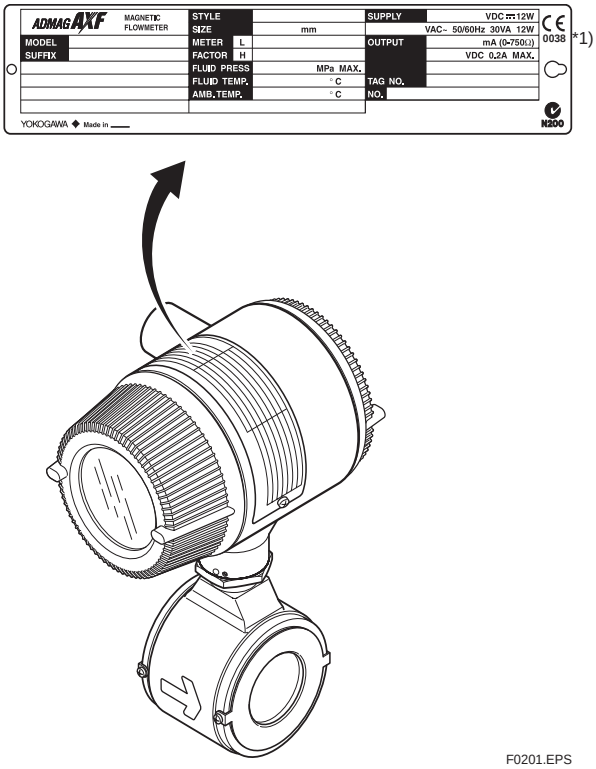


Figure 2.1.1 Data Plate (Integral Flowmeter Style)

*1) In case of the sizes 2.5 to 25 mm (0.1 to 1.0 in.), "0038" is not described.

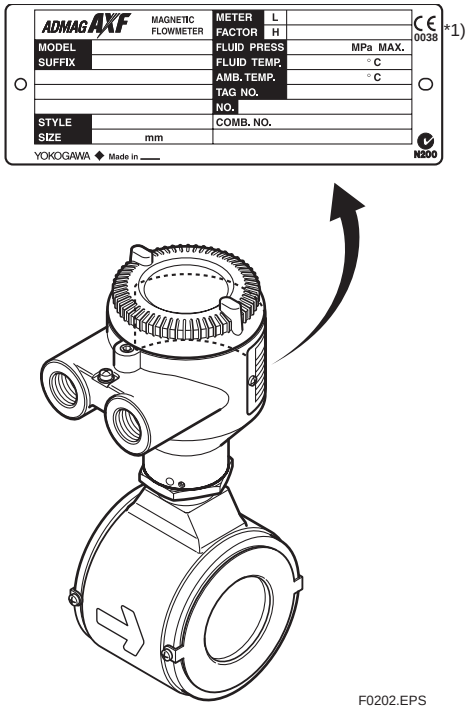


Figure 2.1.2 Data Plate (Remote Flowtube Style)

*1) In case of the sizes 2.5 to 25 mm (0.1 to 1.0 in.), "0038" is not described.

2.2 Accessories

Check that the parts shown below are included in the package:

- Remote Flowtube size 2.5 to 400 mm (0.1 to 16 in.):
  Centering devices: 1 pc. (wafer style only)
  Hexagonal wrench: 2 piece (one each of 1.5 mm and 3 mm nominal sizes)
- Integral Flowmeter
  Centering devices: 1 pc. (wafer style only)
  Spare fuse (T2.0A, 250 V, T: time-lag fuse): 1pc. Use this spare fuse for this product only.)
  Hexagonal wrench: 2 piece (one each of 1.5 mm and 3 mm nominal sizes)

IM 01R20D01-01E-E
3rd edition, Nov. 2006

2.3 Storage Precautions

If the instrument is to be stored for a long period of time after delivery, observe the following points.

- The instrument should be stored in its original packing condition in the storage location.
- Select a storage location that fulfills the following conditions:
  - A place where it will not be exposed to rain or water
  - A place subject to minimal vibrations or shocks
  - Temperature and humidity levels should be as follows:
    Temperature: -30 to 70 °C
    Humidity: 5 to 80 % RH (no condensation)
    The preferred ambient temperature and humidity levels are 25 °C and approximately 65 % RH.
- If the AXF magnetic flowmeter is transferred to the installation site and stored without being installed, its performance may be impaired due to the infiltration of rainwater and so forth. Be sure to install and wire the AXF magnetic flowmeter as soon as possible after transferring it to the installation location.

2.4 Installation Location Precautions

Select the installation location with consideration to the following items to ensure long-term stable operation of the instrument.

- **Ambient Temperature:**
  Avoid installing the instrument in locations with constantly fluctuating temperatures. If the location is subject to radiant heat from the plant, provide heat insulation or improve ventilation.
- **Atmospheric Condition:**
  Avoid installing the instrument in a corrosive atmosphere. In situations where this is unavoidable, consider ways to improve ventilation and to prevent rainwater from entering and being retained in the conduit pipes.
- **Vibrations or Shocks:**
  Avoid installing the instrument in a place subject to shocks or vibrations.
- **Harzardous Duty Type:**
  Explosion proof types can be installed in hazardous areas according to the types of gases for which they are certified. See the description in CHAPTER 8 " HAZARDOUS DUTY TYPE INSTRUMENTS"in this user´s manual.

3. INSTALLATION

3.1 Piping Design Precautions

WARNING

Installation of the magnetic flowmeter must be performed by expert engineers or skilled personnel. No operator shall be permitted to perform procedures relating to installation.

IMPORTANT

Design piping correctly, referring to the following information to prevent damage to flowtubes and to assure accurate measuring.

NOTE

This chapter describes the remote flowtube as an example. The same attention must be paid to the integral flowmeter.

(1) Location

IMPORTANT

Install the flowmeter in a location where it is not exposed to direct sunlight, and where the ambient temperature is between –40° to 60°C (–40° to 140°F). The minimum ambient temperature is limited by the minimum fluid temperature of the flowtube (the lining). For more information, refer to Chapter 6 “OUTLINE”. The flowmeter may be used in an ambient humidity where the relative humidity ranges from 0 to 100 %. However, avoid long-term continuous operation at relative humidity above 95 %.

(2) Noise Avoidance

IMPORTANT

The flowmeter should be installed apart from electrical motors, transformers, and other power sources in order to avoid interference with the measurement.

(3) Required Lengths of Straight Runs

To maintain accurate measurement, see EN 29104 (ISO 9104) “Measurement of fluid flow in closed conduits” which explains the requirements for upstream piping conditions of magnetic flowmeters.

The piping conditions we recommend to our customers as shown in Figure 3.1.1 are based on JIS B7554 and on our piping condition test data.

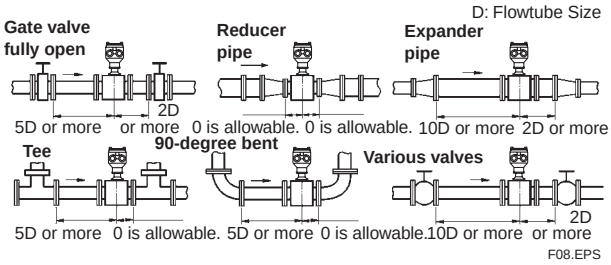


Figure 3.1.1 Required Lengths of Straight Runs

*1: Do not install anything in the vicinity that may interfere with the magnetic field, induced signal voltages, or flow velocity distributions of the flowmeter.

*2: A straight run may not be required on the downstream side of the flowmeter. However, if a downstream valve or other fitting causes irregularity or deviation in flows, provide a straight run of 2D to 3D on the downstream side.

*3: It is highly recommended to mount valves on the downstream side so that deviated flows do not occur in the flowtube and to avoid startup from an empty condition.

IMPORTANT

Do not install the flowmeter where fluid conductivity tends to become unstable. If chemicals are fed near the upstream side of a magnetic flowmeter, they may affect the flow-rate’s indications. To avoid this situation, it is recommended that the chemical feed ports are located on the downstream side of the flowmeter. If it is unavoidable that chemicals must be fed on the upstream side, provide a sufficient length of straight run (approximately 50D) to ensure the proper mixture of fluids.

(4) Maintaining Stable Fluid Conductivity

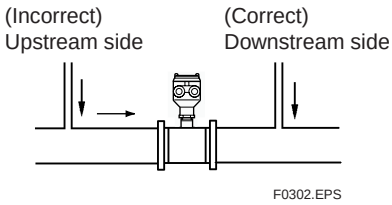


Figure 3.1.2 Chemical Injection

(5) Precautions for Use of Liquid Sealing Compounds

IMPORTANT

Take care in using liquid sealing compounds on the piping, as it may have a negative influence on the flow indications by flowing out and covering the surfaces of an electrode or grounding ring. In particular, take care if a liquid sealing compound is used in the case of vertical piping.

(6) Service Area

Select locations where there is adequate space to service installing, wiring, overhauling, etc.

(7) Bypass Line

It is recommended to install a bypass line to facilitate maintenance and zero adjustment.

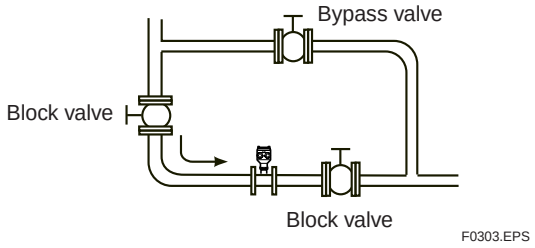


Figure 3.1.3 Bypass Line

(8) Supporting the Flowmeter

CAUTION

Do not secure the flowmeter separately to prevent the vibrations, shocks, and expansion and contraction forces of the piping from affecting it. Fix the pipes first, then support the flowmeter with the pipes. With extra small-sized flowmeters (2.5-10 mm), in particular, fix the flowmeter in parallel with the piping on a mounting base.

(9) Mounting Positions

• Pipes must be fully filled with liquids

IMPORTANT

It is essential that pipes remain fully filled at all times, otherwise flow rate indications may be affected and measurement errors may be caused.

Piping shall be designed so as to maintain the interior of the flowtube filled with fluids.

Vertical mounting is effective in such cases as when fluids tend to separate or solid matter may be precipitated. When choosing vertical mounting, direct the fluids from the bottom to the top to ensure that the pipes remain fully filled.

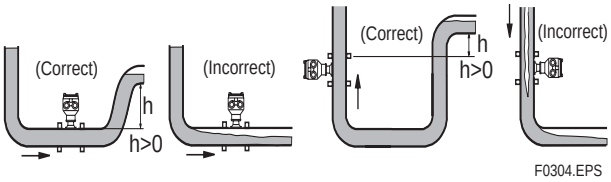


Figure 3.1.4 Mounting Positions

• Avoid air bubbles

IMPORTANT

If air bubbles enter a measurement pipe, flow rate indications may be affected and measurement errors may be caused.

In cases where fluids contain air bubbles, piping must be designed to prevent them from accumulating in the measurement pipe of a flowtube.

If a valve exists near the flowmeter, try to mount the flowmeter on the valve's upstream side in order to prevent a possible reduction of pressure inside the pipe, thereby avoiding the possibility of air bubbles.

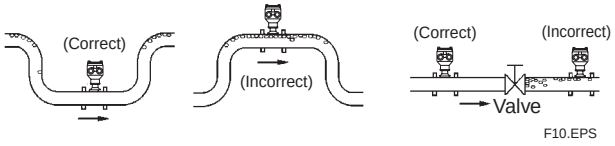


Figure 3.1.5 Avoiding Air Bubbles

• **Mounting orientation**

IMPORTANT

If electrodes are perpendicular to the ground, air bubbles near the top or precipitates at the bottom may cause measurement errors. Ensure that the terminal box of a remote flowtube and converter of an integral flowmeter are mounted above the piping to prevent water from seeping into them.

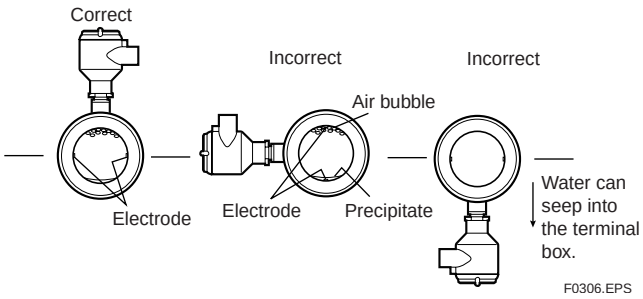


Figure 3.1.6 Mounting Orientation

3.2 Handling Precautions

WARNING

The magnetic flowmeter is a heavy instrument. Be careful that no damage is caused to personnel through accidentally dropping it, or by exerting excessive force on the magnetic flowmeter. When moving the magnetic flowmeter, always use a trolley and have at least two people carry it.

NOTE

This chapter describes the remote flowtube as an example. The same attention must be paid to the integral flowmeter.

3.2.1 General Precautions

(1) Precaution during Transportation

The magnetic flowmeter is packed tightly. When it is unpacked, pay attention to prevent damaging the flowmeter. To prevent accidents while it is transported to the installing location, transport it to the site in its original packing.

CAUTION

In order to lift a magnetic flowmeter that is fitted with eyebolts, proceed as in Figure 3.2.1. Never lift it using a bar passed through the flowtube as this damages the liner severely.

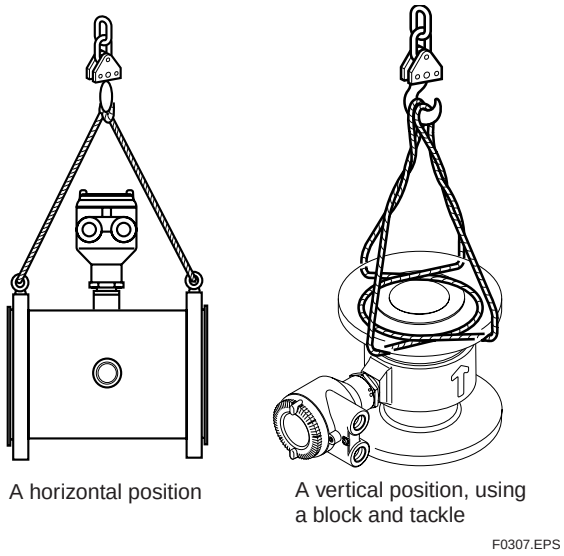


Figure 3.2.1 Lifting Flowmeter

(2) Avoiding Shocks from Impact

CAUTION

Take care not to drop the flowmeter or expose it to excessive shock. In particular, be careful not to subject the flange surface to shock. This may lead to liner damage which will result in inaccurate readings.

(3) Flange Protection Covers

IMPORTANT

Keep the protective covering (i.e. the corrugated cardboard or other cushioning material) in place over the flange except when mounting the flowmeter to the pipe.

(4) Terminal Box Cover

IMPORTANT

As it is possible that the insulation will deteriorate, do not open the terminal box cover until it is time to wire it.

(5) Long-term Non-use

IMPORTANT

It is not recommended to leave the flowmeter unused for a long term after installation. If this situation is unavoidable, take care of the flowmeter by observing the following.

• Confirmation of sealing conditions for the flowmeter

Confirm that the terminal box screw and wiring ports are well sealed. Equip the conduit piping with drain plugs or waterproof glands to prevent moisture or water from penetrating into the flowmeter through the conduit.

• Regular inspections

Inspect the sealing conditions as mentioned above, and the inside of the terminal box at least once a year. Also, due to rain, etc. when it is suspected that water may have penetrated into the inside flowmeter perform supplementary inspections.

3.2.2 Flowmeter Piping

CAUTION

Misaligned or slanted piping can lead to leakage and damage to the flanges.

(1) Correct any misaligned or slanted piping, and any gaps that may exist between mounting flanges before installing the flowmeter (refer to Figure 3.2.2).

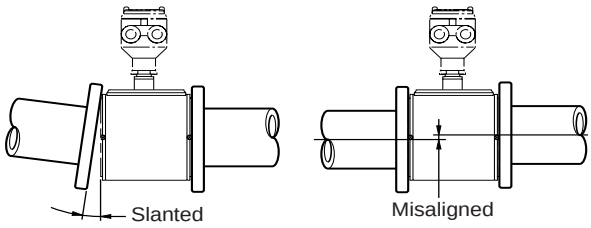


Figure 3.2.2 Slanted and Misaligned Flowmeter Piping

(2) Inside a newly installed pipeline, there may be some unusual substances such as residue from welding or wood chips. Remove them by flushing the piping before mounting the flowmeter. This prevents the lining from being damaged, as well as the occurrence of erroneous measured signals resulting from foreign substances passing through the flowtube during measurement.

3.3 Mounting Procedures

NOTE

*1: The tightening torque value to which gaskets must be tightened varies depending on the type and external dimensions of the lining and the gasket. In this section, the tables indicating tightening torque values include the corresponding gasket types. The internal diameters of the gaskets are close to those of the grounding rings.

*2: For fluids capable of potentially permeating PFA linings (such as nitric acid, hydrofluoric acid, or sodium hydrate at high temperatures), different tightening torque values must be applied. The tables of these torque values is indicated in this section.

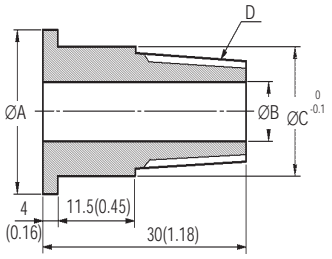
*3: For replacement models for the earlier ADMAG or ADMAG AE, the tightening torque values in the tables can be applied if their process connections, the lining types, and the nominal sizes are the same.

3.3.1 Nominal Diameter 2.5 mm (0.1 in.) to 10 mm (0.4 in.), Union Joint Style

Ceramics linings with diameters of 2.5 (0.1), 5 (0.2), or 10 mm (0.4 in.) are connected using union joints. Weld or screw the connecting fittings in Table 3.3.1 onto the piping. The external dimensions of the fittings are shown in the table.

Table 3.3.1 Fitting Dimensions

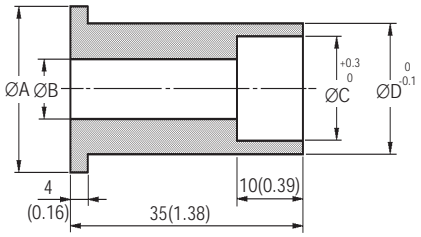
Screw joint (Process connection code: G UR und G UN)



Site mm (in.)	Code	A	B	C	D
2,5 (0.1)	GUR	22 (0.87)	8 (0.31)	18,5 (0.73)	R1/4(PT1/4)
	GUN	22 (0.87)	8 (0.31)	18,5 (0.73)	NPT1/4
5 (0.2)	GUR	22 (0.87)	8 (0.31)	18,5 (0.73)	R1/4(PT1/4)
	GUN	22 (0.87)	8 (0.31)	18,5 (0.73)	NPT1/4
10 (0.4)	GUR	25 (0.98)	10 (0.39)	22,5 (0.89)	R3/8(PT3/8)
	GUN	25 (0.98)	10 (0.39)	22,5 (0.89)	NPT3/8

T0301.EPS

Welded joint (Process connection code: G UW)



Size mm (in.)	Code	A	B	C	D
2.5 (0.1)	GUW	22(0.87)	8(0.31)	14.3(0.56)	18.5(0.73)
5 (0.2)	GUW	22(0.87)	8(0.31)	14.3(0.56)	18.5(0.73)
10 (0.4)	GUW	25(0.98)	10(0.39)	17.8(0.70)	22.5(0.89)

T0302.EPS

(1) Mounting Direction

Mount the flowmeter so that the flow direction of the fluid to be measured is in line with the direction of the arrow mark on the flowmeter.

IMPORTANT

If it is impossible to match the direction of the arrow mark, the direction of the electrical connection can be changed. Refer to Section 5.1 to do this properly.
In case the fluid flow being measured against the arrow direction, refer to the parameter **J20: Flow Direction** in the user's manual of the AXFA11 Magnetic Flowmeter Remote Converter (IM 01R20C01-01E-E) or the AXFA14 Magnetic Flowmeter Remote Converter/AXF Integral Flowmeter [Software Edition] (IM 01R20C02-01E-E).

(2) Connecting of Process Piping

Weld or screw the connection fittings to the process piping.

IMPORTANT

- Be sure to pass the connection fittings through the union joint nuts in advance.
- When welding the fittings, pay attention to the edge preparation, level differences between the fittings and the piping, and the welding current to avoid deforming the piping or causing stagnation portion of the fluid.

(3) Positioning of the Flowmeter

Install the flowmeter on a mounting base and position it so that the center axis of the flowtube is aligned with that of the process piping. Then screw the union joint nuts to the connecting ports of the flowmeter.

CAUTION

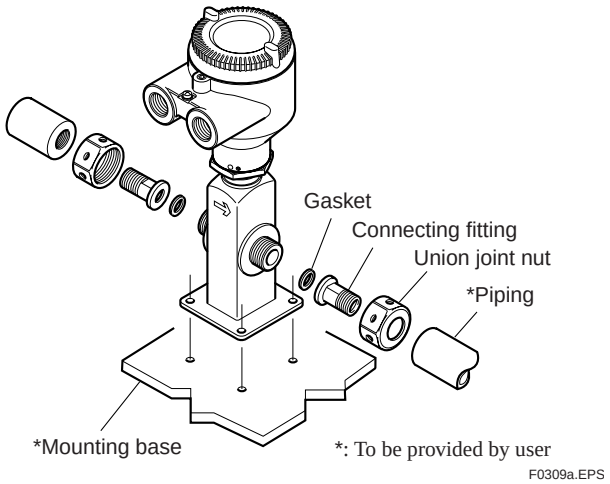
Ceramics pipes may be damaged if the nuts are tightened when the center axes are not properly aligned.

(4) Tightening Nuts

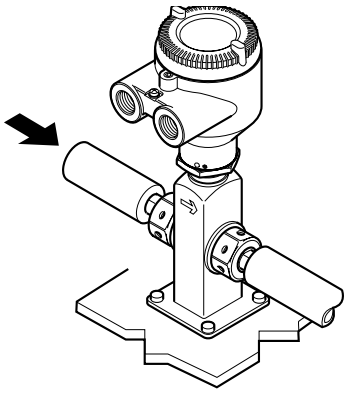
Use a torque wrench to tighten the union joint nuts.

CAUTION

Tighten the union joint nuts according to the tightening torque values in Table 3.3.2. For permeable fluid (such as nitric acid, hydrofluoric acid or sodium hydrate at high temperature), tighten the nuts according to the torque values in Table 3.3.3.
As the gasket material is fluorocarbon PTFE, it is possible that the nuts may loosen as time passes. Retighten the nuts if this is the case. Be sure to use the gasket (thickness is 1.5 mm) supplied with the flowmeter.

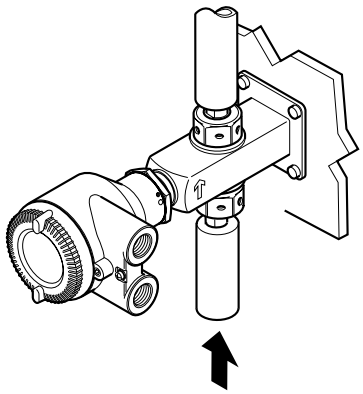


F0309a.EPS



Horizontal mounting

F0309b.EPS



Vertical mounting

F0309c.EPS

Figure 3.3.1 Mounting Procedure for Union Joint Style

Table 3.3.2 Tightening torque values for Union Joint Style

Size mm (in.)	Torque (Nm / {kgf cm} / [in lbf])
2.5 (0.1)	9 to 12 / {91.77 to 122.4} / [79.66 to 106.2]
5 (0.2)	9 to 12 / {91.77 to 122.4} / [79.66 to 106.2]
10 (0.4)	14 to 18 / {142.8 to 183.5} / [123.9 to 159.3]

T0303.EPS

Apply these tightening torque values when the gaskets are Valqua #7020 (standard) or alkali-resistant gaskets for the metal piping (option code /GF).

Table 3.3.3 Tightening torque values for Union Joint Style and Permeable Fluids

Size mm (in.)	Torque (Nm / {kgf cm} / [in lbf])
2.5 (0.1)	11 to 15 / {112.2 to 153} / [97.36 to 132.8]
5 (0.2)	11 to 15 / {112.2 to 153} / [97.36 to 132.8]
10 (0.4)	17 to 23 / {173.4 to 234.5} / [150.5 to 203.6]

T0304.EPS

3.3.2 Nominal Diameter 2.5 mm (0.1 in.) to 40 mm (1.5 in.), Wafer Style

IMPORTANT

Use bolts and nuts in compliance with the flange ratings. When stud-type through-bolts are used, be sure the outside diameter of the shank is smaller than that of the thread ridge. Be sure to choose a gasket with an inner diameter that does not protrude inside the piping (refer to Table 3.3.13). If the inner diameter of the gasket is too large, however, fluid leakage may result.

(1) Mounting Direction

Mount the flowmeter so that the flow direction of the fluid to be measured is in line with the direction of the arrow mark on the flowmeter.

IMPORTANT

If it is impossible to match the direction of the arrow mark, the direction of the electrical connection can be changed. Refer to Section 5.1 to do this properly.
In case the fluid being measured flows against the arrow direction, refer to the parameter **J20: Flow Direction** in the user's manual of the AXFA11 Magnetic Flowmeter Remote Converter (IM 01R20C01-01E-E) or the AXFA14 Magnetic Flowmeter Remote Converter/AXF Integral Flowmeter [Software Edition] (IM 01R20C02-01E-E).

(2) Mounting Centering Devices

To maintain concentricity of the flowmeter with the pipes, install centering devices on the mini-flanges of the flowmeter. Use the appropriate centering devices according to the nominal diameter and the flange ratings.

(3) Positioning the Flowmeter

Pass two through-bolts through the adjacent holes of both flanges and position the flowmeter so that the mini-flanges and the centering devices come in close contact with each other. Pass the other through-bolts through the other holes (refer to Figures 3.3.2 and 3.3.3). In case stud-type through-bolts are used, position them in such a way that the centering devices come in contact with the bolt threads.

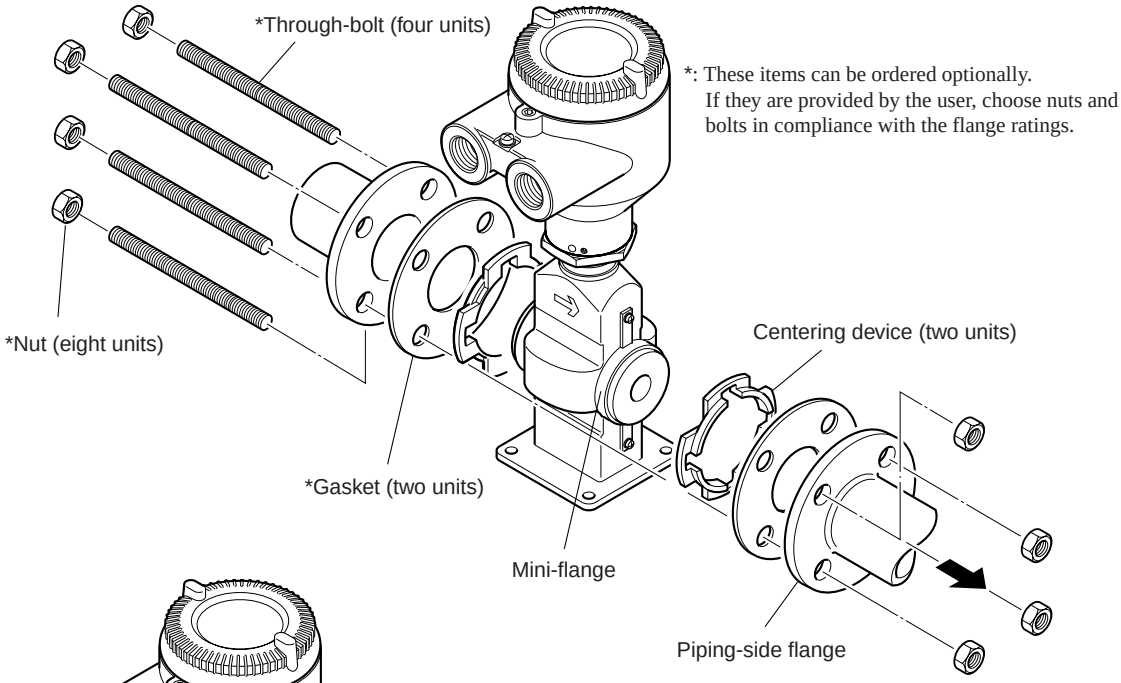
(4) Tightening Nuts

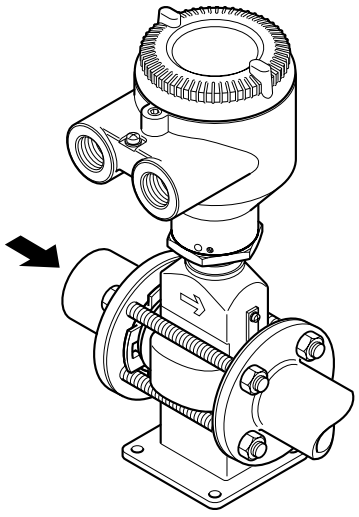
Tighten the nuts according to the torque values for metal piping in Table 3.3.4. For PVC piping, select an option code of /GA, /GC, or /GD, use rubber gaskets and tighten the nuts to the torque values for PVC piping in Table 3.3.5.

For permeable fluids (such as nitric acid, hydrofluoric acid, or sodium hydrate at high temperatures), tighten the nuts according to the torque values in Table 3.3.6.

⚠ CAUTION

For a flowmeter with fluorocarbon PFA lining, it is possible that the nuts may loosen as time passes, so tighten them regularly. Be sure to tighten the nuts according to the prescribed torque values. Tighten them diagonally with the same torque values, step by step up to the prescribed torque value.


*Through-bolt (four units)
*: These items can be ordered optionally.
If they are provided by the user, choose nuts and bolts in compliance with the flange ratings.
*Nut (eight units)
Centering device (two units)
*Gasket (two units)
Mini-flange
Piping-side flange
F0310a.EPS



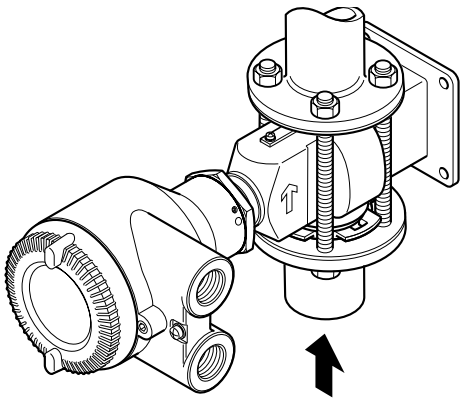


Figure 3.3.2 Mounting Procedure for Wafer Style (size: 2.5 (0.1) to 15 mm (0.5 in.))

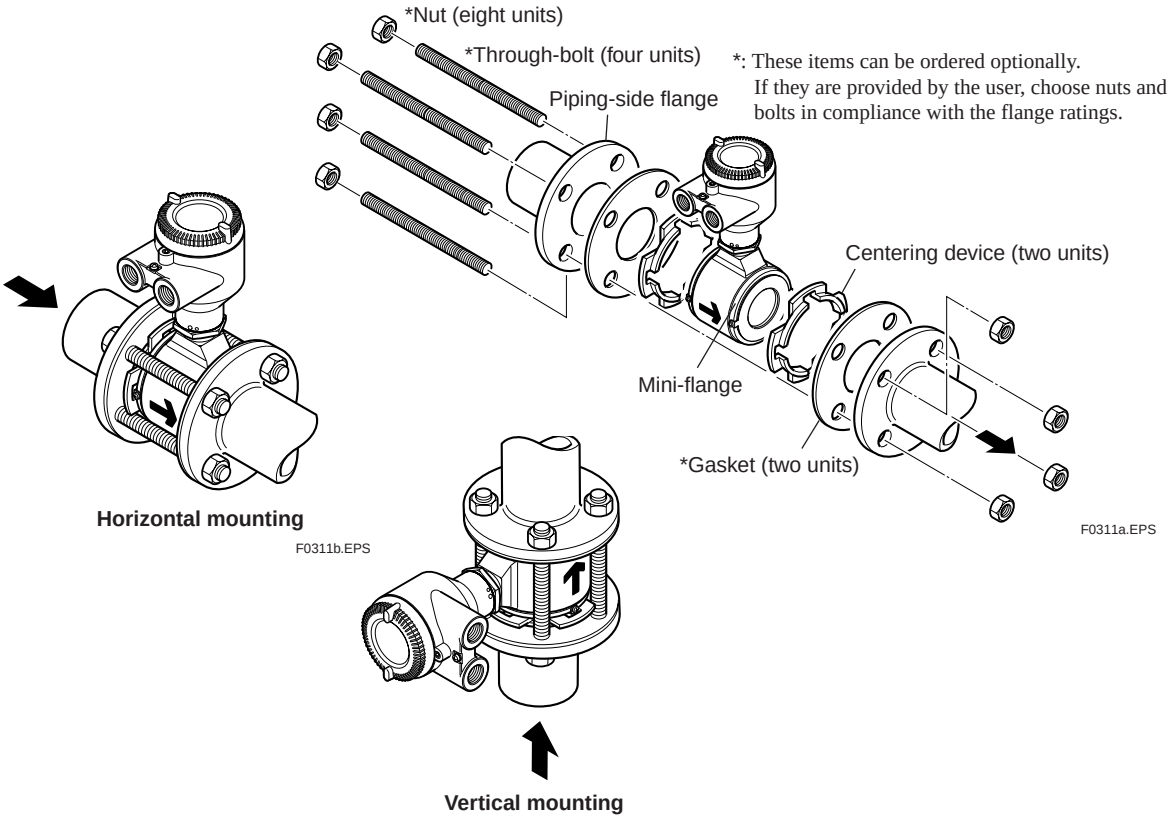


Figure 3.3.3 Mounting Procedure for Wafer Style (size: 25 (1.0), 32 (1.25), and 40 mm (1.5 in.))

Table 3.3.4 Wafer Style Tightening Torque Values for Metal Piping

	Tightening torque values for PFA/Polyurethane Rubber lining type (Nm / {kgf cm} / [in lbf])		
Gasket types within flowtube	No gasket (standard)		
Gasket types for user's flange	Non-asbestos fiber gasket, PTFE-sheathed non-asbestos gasket (optional codes BCF and BSF), or the equivalent in hardness		
Flange ratings / Size mm (in.)	ANSI Class 150, and DIN PN10	ANSI Class 300, and DIN PN16	DIN PN40
2.5 (0.1)	7.2 to 8.4 / {73.42 to 85.66} / [63.72 to 74.35]	7.3 to 8.4 / {74.44 to 85.66} / [64.61 to 74.35]	7.6 to 8.4 / {77.5 to 85.66} / [67.26 to 74.35]
5 (0.2)	7.2 to 8.4 / {73.42 to 85.66} / [63.72 to 74.35]	7.3 to 8.4 / {74.44 to 85.66} / [64.61 to 74.35]	7.6 to 8.4 / {77.5 to 85.66} / [67.26 to 74.35]
10 (0.4)	7.2 to 8.4 / {73.42 to 85.66} / [63.72 to 74.35]	7.3 to 8.4 / {74.44 to 85.66} / [64.61 to 74.35]	7.6 to 8.4 / {77.5 to 85.66} / [67.26 to 74.35]
15 (0.5)	7.2 to 8.4 / {73.42 to 85.66} / [63.72 to 74.35]	7.3 to 8.4 / {74.44 to 85.66} / [64.61 to 74.35]	7.6 to 8.4 / {77.5 to 85.66} / [67.26 to 74.35]
25 (1.0)	23.5 to 27.3 / {239.6 to 278.4} / [208 to 241.6]	23.7 to 27.3 / {241.7 to 278.4} / [209.8 to 241.6]	22.3 to 27.3 / {227.4 to 278.4} / [197.4 to 241.6]
32 (1.25)	26.2 to 30.5 / {267.2 to 311} / [231.9 to 269.9]	26.6 to 30.5 / {271.2 to 311} / [235.4 to 269.9]	28.0 to 30.5 / {285.5 to 311} / [247.8 to 269.9]
40 (1.5)	36.2 to 42.4 / {369.1 to 432.4} / [320.4 to 375.3]	36.9 to 42.4 / {376.3 to 432.4} / [326.6 to 375.3]	39.1 to 42.4 / {398.7 to 432.4} / [346.1 to 375.3]

	Tightening torque values for Ceramics lining type (Nm / {kgf cm} / [in lbf])		
Gasket types within flowtube	Fluororesin with ceramic fillers (Valqua #7020) (standard) gasket, or fluororesin with carbon gasket (optional code GF)		
Gasket types for user's flange	Non-asbestos gasket, PTFE-sheathed non-asbestos gasket (optional codes BCF and BSF), or the equivalent in hardness		
Flange ratings / Size mm (in.)	ANSI Class 150, and DIN PN10	ANSI Class 300, and DIN PN16	DIN PN40
15 (0.5)	2.9 to 4.8 / {29.57 to 48.95} / [25.67 to 42.48]	2.9 to 4.8 / {29.57 to 48.95} / [25.67 to 42.48]	3.0 to 5.0 / {30.59 to 50.99} / [26.55 to 44.25]
25 (1.0)	8.2 to 13.6 / {83.62 to 138.7} / [72.57 to 120.4]	8.2 to 13.7 / {83.62 to 139.7} / [72.57 to 121.3]	7.9 to 13.1 / {80.56 to 133.6} / [69.92 to 115.9]
40 (1.5)	14.1 to 23.6 / {143.8 to 240.7} / [124.8 to 208.9]	14.4 to 24.1 / {146.8 to 245.8} / [127.4 to 213.3]	15.5 to 25.8 / {158.1 to 263.1} / [137.2 to 228.3]

T0305.EPS

Table 3.3.5 Wafer Type Tightening Torque Values for PVC Piping

Tightening torque values for PFA lining type (Nm / {kgf cm} / [in lbf])			
Gasket types within flowtube	Fluororubber gasket (optional codes GA, GC, and GD)		
Gasket types for user's flange	Fluororubber gasket, chloroprene rubber gasket (optional codes BSC and BCC), or the equivalent in hardness		
Flange ratings / Size mm (in.)	ANSI Class 150, and DIN PN10	ANSI Class 300, and DIN PN16	DIN PN40
2.5 (0.1)	1.5 to 2.5 / {15.3 to 25.49} / [13.28 to 22.13]	1.5 to 2.5 / {15.3 to 25.49} / [13.28 to 22.13]	1.5 to 2.4 / {15.3 to 24.47} / [13.28 to 21.24]
5 (0.2)	1.5 to 2.5 / {15.3 to 25.49} / [13.28 to 22.13]	1.5 to 2.5 / {15.3 to 25.49} / [13.28 to 22.13]	1.5 to 2.4 / {15.3 to 24.47} / [13.28 to 21.24]
10 (0.4)	1.5 to 2.5 / {15.3 to 25.49} / [13.28 to 22.13]	1.5 to 2.5 / {15.3 to 25.49} / [13.28 to 22.13]	1.5 to 2.4 / {15.3 to 24.47} / [13.28 to 21.24]
15 (0.5)	1.5 to 2.5 / {15.3 to 25.49} / [13.28 to 22.13]	1.5 to 2.5 / {15.3 to 25.49} / [13.28 to 22.13]	1.5 to 2.4 / {15.3 to 24.47} / [13.28 to 21.24]
25 (1.0)	4.9 to 8.1 / {49.97 to 82.6} / [43.37 to 71.69]	5.0 to 8.3 / {50.99 to84.64 } / [44.25 to 73.46]	4.3 to 7.2 / {43.85 to 73.42} / [38.06 to 63.72]
32 (1.25)	5.5 to 9.2 / {56.08 to 93.81} / [48.68 to 81.43]	5.7 to 9.5 / {58.12 to 96.87} / [50.45 to 84.08]	5.4 to 8.9 / {55.06 to 90.75} / [47.79 to 78.77]
40 (1.5)	7.7 to 12.9 / {78.52 to 131.5} / [68.15 to 114.2]	8.1 to 13.4 / {82.6 to 136.6} / [71.69 to 118.6]	7.5 to 12.5 / {76.48 to 127.5} / [66.38 to 110.6]

Tightening torque values for Ceramics lining type (Nm / {kgf cm} / [in lbf])			
Gasket types within flowtube	Fluororubber gasket (optional codes GA, GC, and GD)		
Gasket types for user's flange	Fluororubber gasket, chloroprene rubber gasket (optional codes BSC and BCC), or the equivalent in hardness		
Flange ratings / Size mm (in.)	ANSI Class 150, and DIN PN10	ANSI Class 300, and DIN PN16	DIN PN40
15 (0.5)	0.6 to 1.0 / {6.118 to 10.2} / [5.31 to 8.85]	0.6 to 1.0 / {6.118 to 10.2} / [5.31 to 8.85]	0.6 to 1.0 / {6.118 to 10.2} / [5.31 to 8.85]
25 (1.0)	1.7 to 2.8 / {17.34 to 28.55} / [15.05 to 24.78]	1.7 to 2.8 / {17.34 to 28.55} / [15.05 to 24.78]	1.5 to 2.5 / {15.3 to 25.49} / [13.28 to 22.13]
40 (1.5)	3.0 to 5.0 / {30.59 to 50.99} / [26.55 to 44.25]	3.1 to 5.2 / {31.61 to 53.03} / [27.44 to 46.02]	2.9 to 4.8 / {29.57 to 48.95} / [25.67 to 42.48]

T0306.EPS

Table 3.3.6 Wafer Type Tightening Torque Values for Metal Piping and Permeable Fluids

Tightening torque values for PFA lining type (N m / {kgf cm} / [in lbf])			
Gasket types within flowtube	No gasket (standard)		
Gasket types for user's flange	PTFE-sheathed non-asbestos gasket (optional codes BCF and BSF), or the equivalent in hardness		
Flange ratings / Size mm (in.)	ANSI Class 150, and DIN PN10	ANSI Class 300, and DIN PN16	DIN PN40
2.5 (0.1)	10.8 to 12.4 / {110.1 to 126.4} / [95.59 to 109.7]	10.8 to 12.4 / {110.1 to 126.4} / [95.59 to 109.7]	11.1 to 12.4 / {113.2 to 126.4} / [98.24 to 109.7]
5 (0.2)	10.8 to 12.4 / {110.1 to 126.4} / [95.59 to 109.7]	10.8 to 12.4 / {110.1 to 126.4} / [95.59 to 109.7]	11.1 to 12.4 / {113.2 to 126.4} / [98.24 to 109.7]
10 (0.4)	10.8 to 12.4 / {110.1 to 126.4} / [95.59 to 109.7]	10.8 to 12.4 / {110.1 to 126.4} / [95.59 to 109.7]	11.1 to 12.4 / {113.2 to 126.4} / [98.24 to 109.7]
15 (0.5)	10.8 to 12.4 / {110.1 to 126.4} / [95.59 to 109.7]	10.8 to 12.4 / {110.1 to 126.4} / [95.59 to 109.7]	11.1 to 12.4 / {113.2 to 126.4} / [98.24 to 109.7]
25 (1.0)	34.9 to 40.1 / {355.9 to 408.9} / [308.9 to 354.9]	35.2 to 40.1 / {358.9 to 408.9} / [311.5 to 354.9]	32.3 to 37.1 / {329.4 to 378.3} / [285.9 to 328.4]
32 (1.25)	38.8 to 44.6 / {395.6 to 454.8} / [343.4 to 394.7]	39.2 to 44.6 / {399.7 to 454.8} / [346.9 to 394.7]	40.6 to 46.7 / {414.0 to 476.2} / [359.3 to 413.3]
40 (1.5)	53.5 to 61.5 / {545.5 to 627.1} / [473.5 to 544.3]	54.2 to 61.5 / {552.7 to 627.1} / [479.7 to 544.3]	56.4 to 61.5 / {575.1 to 627.1} / [499.2 to 544.3]

Tightening torque values for Ceramics lining type (Nm / {kgf cm} / [in lbf])			
Gasket types within flowtube	Fluororesin with ceramic fillers (Valqua #7020) gasket (standard), or fluororesin with carbon gasket (optional code GF)		
Gasket types for user's flange	PTFE-sheathed non-asbestos gasket (optional codes BCF and BSF), or the equivalent in hardness		
Flange ratings / Size mm (in.)	ANSI Class 150, and DIN PN10	ANSI Class 300, and DIN PN16	DIN PN40
15 (0.5)	4.2 to 7.1 / {42.83 to 72.4} / [37.17 to 62.84]	4.3 to 7.1 / {43.85 to 72.4} / [38.06 to 62.84]	4.4 to 7.3 / {44.87 to 74.44} / [38.94 to 64.61]
25 (1.0)	12.1 to 20.2 / {123.4 to 206.0} / [107.1 to 178.8]	12.2 to 20.3 / {124.4 to 207.0} / [108.0 to 179.7]	11.3 to 18.9 / {115.2 to 192.7} / [100.0 to 167.3]
40 (1.5)	20.8 to 34.7 / {212.1 to 353.8} / [184.1 to 307.1]	21.1 to 35.2 / {215.2 to 358.9} / [186.7 to 311.5]	22.2 to 37.0 / {226.4 to 377.3} / [196.5 to 327.5]

T0307.EPS

3.3.3 Nominal Diameter 50 mm (2.0 in.) to 300 mm (12.0 in.), Wafer Style

IMPORTANT

Use bolts and nuts in compliance with the flange ratings. When stud-type through-bolts are used, be sure the outside diameter of the shank is smaller than that of the thread ridge. Be sure to choose a gasket with an inner diameter that does not protrude inside the piping (refer to Table 3.3.13). If the inner diameter of the gasket is too large, however, fluid leakage may result.

(1) Mounting Direction

Mount the flowmeter so that the flow direction of the fluid to be measured is in line with the direction of the arrow mark on the flowmeter.

IMPORTANT

If it is impossible to match the direction of the arrow mark, the direction of the electrical connection can be changed. Refer to Section 5.1 to do this properly.
In case the fluid being measured flows against the arrow direction, refer to the parameter **J20: Flow Direction** in the user's manual of the AXFA11 Magnetic Flowmeter Remote Converter (IM 01R20C01-01E-E) or the AXFA14 Magnetic Flowmeter Remote Converter/AXF Integral Flowmeter [Software Edition] (IM 01R20C02-01E-E).

(2) Mounting Centering Devices

To maintain concentricity of the flowmeter with the pipes, install centering devices. From the process piping side, pass two through-bolts through the four centering devices (two for each bolt) and the adjacent two holes (the lower two holes for horizontal mounting) of both of the flanges (refer to Figure 3.3.4). Use the appropriate centering devices according to the nominal diameter and the flange ratings. The centering devices are engraved with an identifying character. Use the appropriate ones which meet the required specifications by referring to Tables 3.3.10 and 3.3.11 (AXF standard models) and Table 3.3.12 (replacement models for the earlier ADMAG or ADMAG AE).

(3) Positioning of the Flowmeter

Position the flowmeter so that the Mini-flanges and the centering devices come in close contact with each other. Be careful to prevent the four centering devices from coming into contact with the housing. If stud-type through-bolts are used, position them in such a way that the four centering devices come in contact with the bolt threads (refer to Figure 3.3.4). Pass the other through-bolts through from the process piping side.

(4) Tightening Nuts

Tighten the nuts according to the torque values for metal piping in Table 3.3.7. For PVC piping, select an option code of /GA, /GC, or /GD, use rubber gaskets and tighten the nuts to the torque values for PVC piping in Table 3.3.8.
For permeable fluids (such as nitric acid, hydrofluoric acid, or sodium hydrate at high temperatures), tighten the nuts according to the torque values in Table 3.3.9.

CAUTION

For a flowmeter with fluorocarbon PFA lining, it is possible that the nuts may loosen as time passes, so tighten them regularly. Be sure to tighten the nuts according to the prescribed torque values. Tighten them diagonally with the same torque values, step by step up to the prescribed torque value.

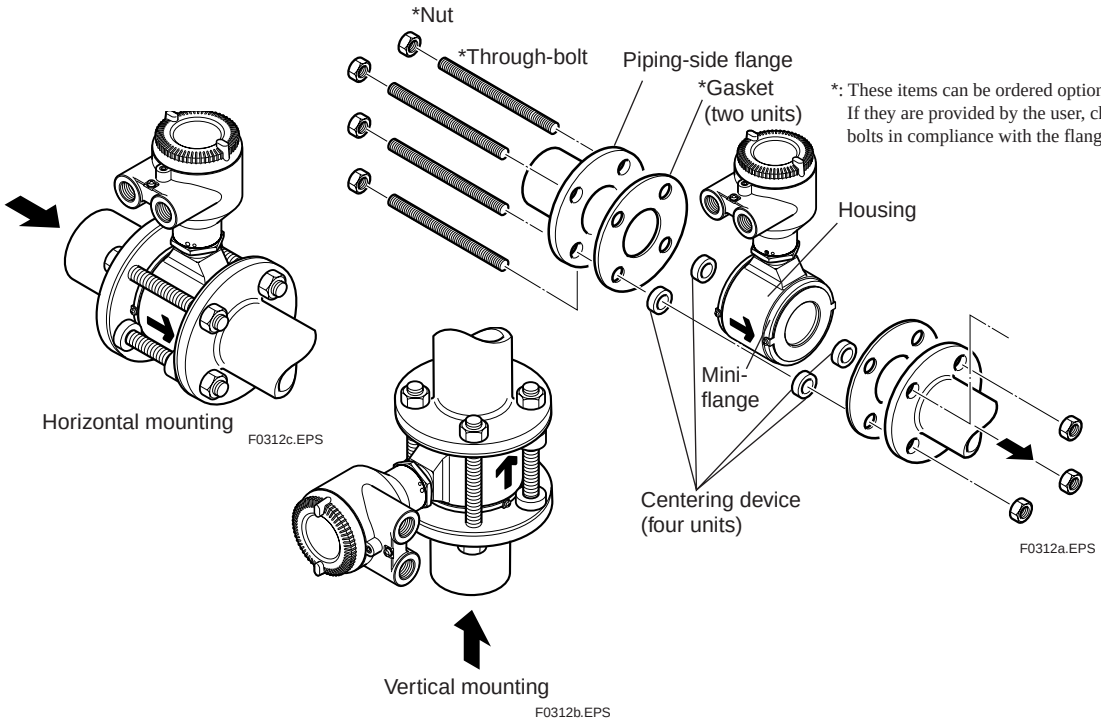


Figure 3.3.4 Mounting Procedure for Wafer Style(size: 50 mm (2 in.) to 300 mm (12 in.))

Table 3.3.7 Wafer Style Tightening Torque Values for Metal Piping

Tightening torque values for PFA/Polyurethane Rubber/Natural Soft Rubber/EPDM Rubber lining type — Unit: N-m {kgf-cm} [in-lbf]

Gasket types within flowtube	No gasket (standard)							
Gasket types for user's flange	Non-asbestos fiber gasket, PTFE-sheathed non-asbestos gasket (optional codes BCF and BSF), or the equivalent in hardness							
Flange ratings / Size mm (inch)	JIS 10K	ANSI Class 150	DIN PN10	JIS20K	ANSI Class 300	DIN PN16	DIN PN40	JIS F12 (JIS 75M)
50 (2.0)	45.0 to 56.8 {458.9 to 579.2} [398.3 to 502.7]	45.0 to 56.8 {458.9 to 579.2} [398.3 to 502.7]	—	22.5 to 25.9 {229.4 to 264.1} [199.1 to 229.2]	22.5 to 25.9 {229.4 to 264.1} [199.1 to 229.2]	—	50.0 to 57.5 {509.9 to 586.3} [442.5 to 508.9]	—
65 (2.5)	61.3 to 70.5 {625.1 to 718.9} [542.5 to 624.0]	61.3 to 70.5 {625.1 to 718.9} [542.5 to 624.0]	—	30.8 to 35.4 {314.1 to 361.0} [272.6 to 313.3]	30.8 to 35.4 {314.1 to 361.0} [272.6 to 313.3]	56.1 to 70.8 {572.1 to 722.0} [496.5 to 626.6]	—	—
80 (3.0)	35.0 to 40.3 {356.9 to 410.9} [309.8 to 356.7]	76.0 to 80.9 {775.0 to 825.0} [672.6 to 716.0]	—	39.9 to 45.9 {406.9 to 468.1} [353.1 to 406.2]	39.9 to 45.9 {406.9 to 468.1} [353.1 to 406.2]	39.9 to 45.9 {406.9 to 468.1} [353.1 to 406.2]	—	68.4 to 78.7 {697.5 to 802.5} [605.4 to 696.5]
100 (4.0)	46.1 to 53 {470.1 to 540.5} [408.0 to 469.1]	46.1 to 53 {470.1 to 540.5} [408.0 to 469.1]	—	52.9 to 60.8 {539.4 to 620.0} [468.2 to 538.1]	52.9 to 60.8 {539.4 to 620.0} [468.2 to 538.1]	52.9 to 60.8 {539.4 to 620.0} [468.2 to 538.1]	—	88.6 to 101.9 {903.5 to 1039} [784.1 to 901.9]
125 (5.0)	73.7 to 84.8 {751.5 to 864.7} [652.3 to 750.5]	73.7 to 84.8 {751.5 to 864.7} [652.3 to 750.5]	—	80.5 to 92.6 {820.9 to 944.3} [712.5 to 819.5]	80.5 to 92.6 {820.9 to 944.3} [712.5 to 819.5]	80.5 to 92.6 {820.9 to 944.3} [712.5 to 819.5]	—	75.1 to 86.4 {765.8 to 881.0} [664.7 to 764.7]
150 (6.0)	85.4 to 98.2 {870.8 to 1001} [755.8 to 869.1]	85.4 to 98.2 {870.8 to 1001} [755.8 to 869.1]	—	61.0 to 70.2 {622.0 to 715.8} [539.9 to 621.3]	61.0 to 70.2 {622.0 to 715.8} [539.9 to 621.3]	91.2 to 96.3 {930.0 to 982.0} [807.2 to 852.3]	—	86.3 to 99.2 {880.0 to 1012} [763.8 to 878.0]
200 (8.0)	78.8 to 90.6 {803.5 to 923.9} [697.4 to 801.8]	113.6 to 135.8 {1158 to 1385} [1005 to 1202]	113.6 to 135.8 {1158 to 1385} {1005 to 1202]	87.5 to 100.6 {892.3 to 1026} [774.4 to 890.3]	87.5 to 100.6 {892.3 to 1026} [774.4 to 890.3]	87.5 to 100.6 {892.3 to 1026} [774.4 to 890.3]	—	88.6 to 101.9 {903.5 to 1039} [784.1 to 901.9]
250 (10)	119.4 to 137.3 {1218 to 1400} [1057 to 1215]	119.4 to 137.3 {1218 to 1400} [1057 to 1215]	119.4 to 137.3 {1218 to 1400} {1057 to 1215]	—	—	—	—	158.1 to 181.8 {1612 to 1854} [1399 to 1609]
300 (12)50 (2.0)	83.0 to 99.2 {846.4 to 1012} [734.6 to 878]45.0 to	105.2 to 121.0 {1073 to 1234} [931.1 to 1071]45.0	105.2 to 121.0 {1073 to 1234} {931.1 to 1071]	—22.5 to 25.9 {229.4 to 264.1}	—22.5 to 25.9 {229.4 to 264.1}	— —	—50.0 to 57.5 {509.9 to 586.3}	146.6 to 168.6 {1495 to 1719} [1297 to 1492]

Tightening torque values for Ceramics lining type — Unit: N-m {kgf-cm} [in-lbf]

Gasket types within flowtube	Fluororesin with ceramic fillers (Valqua #7020) gasket (standard), or fluororesin with carbon gasket (optional code GF)							
Gasket types for user's flange	Non-asbestos gasket, PTFE-sheathed non-asbestos gasket (optional codes BCF and BSF), or the equivalent in hardness							
Flange ratings / Size mm (inch)	JIS 10K	ANSI Class 150	DIN PN10	JIS20K	ANSI Class 300	DIN PN16	DIN PN40	JIS F12 (JIS 75M)
50 (2.0)	29.9 to 49.8 {304.9 to 507.8} [264.6 to 440.8]	29.9 to 49.8 {304.9 to 507.8} [264.6 to 440.8]	—	30.5 to 50.9 {311.0 to 519.0} [269.9 to 450.5]	30.5 to 50.9 {311.0 to 519.0} [269.9 to 450.5]	—	32.7 to 54.5 {333.4 to 555.7} [289.4 to 482.4]	—
80 (3.0)	37.1 to 61.8 {378.3 to 630.2} [328.4 to 547.0]	37.1 to 61.8 {378.3 to 630.2} [328.4 to 547.0]	—	37.6 to 62.7 {383.4 to 639.4} [332.8 to 554.9]	37.6 to 62.7 {383.4 to 639.4} [332.8 to 554.9]	37.6 to 62.7 {383.4 to 639.4} [332.8 to 554.9]	—	56.3 to 93.8 {574.1 to 956.5} [498.3 to 830.2]
100 (4.0)	48.9 to 81.5 {498.6 to 831.1} [432.8 to 721.3]	48.9 to 81.5 {498.6 to 831.1} [432.8 to 721.3]	—	49.9 to 83.1 {508.8 to 847.4} [441.6 to 735.5]	49.9 to 83.1 {508.8 to 847.4} [441.6 to 735.5]	49.9 to 83.1 {508.8 to 847.4} [441.6 to 735.5]	—	74.2 to 123.7 {756.6 to 1261} [656.7 to 1095]
150 (6.0)	101.4 to 169.0 {1034 to 1723} [897.5 to 1496]	101.4 to 169.0 {1034 to 1723} [897.5 to 1496]	—	104.4 to 174.0 {1065 to 1774} [924.0 to 1540]	104.4 to 174.0 {1065 to 1774} [924.0 to 1540]	104.4 to 174.0 {1065 to 1774} [924.0 to 1540]	—	82.2 to 137.0 {838.2 to 1397} [727.5 to 1213]
200 (8.0)50 (2.0)	142.3 to 237.2 {1451 to 2419} [1259 to2099]29.9 to	142.3 to 237.2 {1451 to 2419} [1259 to2099]29.9 to	142.3 to 237.2 {1451 to 2419} [1259 to2099]	98.5 to 164.2 {1004 to 1674} [871.8 to 1453]30.5	98.5 to 164.2 {1004 to 1674} [871.8 to 1453]30.5	98.5 to 164.2 {1004 to 1674} [871.8 to 1453]	— 32.7 to 54.5	86.7 to 144.6 {884.1 to 1475} [767.3 to 1280]

T0308.EPS

Table 3.3.8 Wafer Style Tightening Torque Values for PVC Piping

Tightening torque values for PFA lining type

Unit: N-m {kgf-cm} [in-lbf]

Gasket types within flowtube	Fluororubber gasket (optional codes GA, GC, and GD)							
Gasket types for user's flange	Fluororubber gasket, chloroprene rubber gasket (optional codes BSC and BCC), or the equivalent in hardness							
Flange ratings / Size mm (inch)	JIS 10K	ANSI Class 150	DIN PN10	JIS20K	ANSI Class 300	DIN PN16	DIN PN40	JIS F12 (JIS 75M)
50 (2.0)	9.9 to 16.5 {101.0 to 168.3} [87.6 to 146.0]	9.9 to 16.5 {101.0 to 168.3} [87.6 to 146.0]	—	10.6 to 17.6 {108.1 to 179.5} [93.8 to 155.8]	10.6 to 17.6 {108.1 to 179.5} [93.8 to 155.8]	—	9.5 to 15.9 {96.9 to 162.1} [84.1 to 140.7]	—
65 (2.5)	14.2 to 23.7 {144.8 to 241.7} [125.7 to 209.8]	14.2 to 23.7 {144.8 to 241.7} [125.7 to 209.8]	—	15.5 to 25.9 {158.1 to 264.1} [137.2 to 229.2]	15.5 to 25.9 {158.1 to 264.1} [137.2 to 229.2]	28.2 to 51.8 {287.6 to 528.2} [249.6 to 458.4]	—	—
80 (3.0)	8.0 to 13.3 {81.6 to 135.6} [70.8 to 117.7]	17.4 to 26.7 {177.4 to 272.3} [154.0 to 236.3]	—	9.7 to 16.1 {98.9 to 164.2} [85.8 to 142.5]	9.7 to 16.1 {98.9 to 164.2} [85.8 to 142.5]	9.7 to 16.1 {98.9 to 164.2} [85.8 to 142.5]	—	15.4 to 25.6 {157.0 to 261.0} [136.3 to 226.6]
100 (4.0)	11.3 to 18.8 {115.2 to 191.7} [100.0 to 166.4]	11.3 to 18.8 {115.2 to 191.7} [100.0 to 166.4]	—	14.2 to 23.6 {144.8 to 240.7} [125.7 to 208.9]	14.2 to 23.6 {144.8 to 240.7} [125.7 to 208.9]	14.2 to 23.6 {144.8 to 240.7} [125.7 to 208.9]	—	21.1 to 35.1 {215.2 to 357.9} [186.7 to 310.6]
125 (5.0)	18.8 to 31.3 {191.7 to 319.2} [166.4 to 277.0]	18.8 to 31.3 {191.7 to 319.2} [166.4 to 277.0]	—	22.3 to 37.2 {227.4 to 379.3} [197.4 to 329.2]	22.3 to 37.2 {227.4 to 379.3} [197.4 to 329.2]	22.3 to 37.2 {227.4 to 379.3} [197.4 to 329.2]	—	18.5 to 30.8 {188.6 to 314.1} [163.7 to 272.6]
150 (6.0)	22.5 to 37.6 {229.4 to 383.4} [199.1 to 332.8]	22.5 to 37.6 {229.4 to 383.4} [199.1 to 332.8]	—	27.2 to 45.3 {277.4 to 461.9} [240.7 to 400.9]	27.2 to 45.3 {277.4 to 461.9} [240.7 to 400.9]	40.7 to 62.1 {415.0 to 633.2} [360.2 to 549.6]	—	21.8 to 36.3 {222.3 to 370.2} [192.9 to 321.3]
200 (8.0)50 (2.0)	22.1 to 36.9 {225.4 to 376.3} [195.6 to 326.6]9.9	31.9 to 55.3 {325.3 to 563.9} [282.3 to 489.4]9.9	31.9 to 55.3 {325.3 to 563.9} [282.3 to 489.4]	27.3 to 45.3 {278.4 to 461.9} [241.6 to 400.9]10.6	27.3 to 45.3 {278.4 to 461.9} [241.6 to 400.9]10.6	27.3 to 45.3 {278.4 to 461.9} [241.6 to 400.9]	—	23.8 to 39.6 {242.7 to 403.8} [210.6 to 350.5]

Tightening torque values for Ceramics lining type

Unit: N-m {kgf-cm} [in-lbf]

Gasket types within flowtube	Fluororubber gasket (optional codes GA, GC, and GD)							
Gasket types for user's flange	Fluororubber gasket, chloroprene rubber gasket (optional codes BSC and BCC), or the equivalent in hardness							
Flange ratings / Size mm (inch)	JIS 10K	ANSI Class 150	DIN PN10	JIS20K	ANSI Class 300	DIN PN16	DIN PN40	JIS F12 (JIS 75M)
50 (2.0)	4.5 to 7.4 {45.89 to 75.46} [39.83 to 65.49]	4.5 to 7.4 {45.89 to 75.46} [39.83 to 65.49]	—	4.8 to 7.9 {48.95 to 80.56} [42.48 to 69.92]	4.8 to 7.9 {48.95 to 80.56} [42.48 to 69.92]	—	4.3 to 7.1 {43.85 to 72.4} [38.06 to 62.84]	—
80 (3.0)	4.4 to 7.3 {44.87 to 74.44} [38.94 to 64.61]	4.4 to 7.3 {44.87 to 74.44} [38.94 to 64.61]	—	4.8 to 7.9 {48.95 to 80.56} [42.48 to 69.92]	4.8 to 7.9 {48.95 to 80.56} [42.48 to 69.92]	4.8 to 7.9 {48.95 to 80.56} [42.48 to 69.92]	—	8.6 to 14.4 {87.7 to 146.8} [76.12 to 127.4]
100 (4.0)	6.4 to 10.7 {65.26 to 109.1} [56.64 to 94.7]	6.4 to 10.7 {65.26 to 109.1} [56.64 to 94.7]	—	7.2 to 11.9 {73.42 to 121.3} [63.72 to 105.3]	7.2 to 11.9 {73.42 to 121.3} [63.72 to 105.3]	7.2 to 11.9 {73.42 to 121.3} [63.72 to 105.3]	—	12.2 to 20.3 {124.4 to 207.0} [108.0 to 179.7]
150 (6.0)	15.1 to 25.2 {154.0 to 257.0} [133.6 to 223.0]	15.1 to 25.2 {154.0 to 257.0} [133.6 to 223.0]	—	17.6 to 29.3 {179.5 to 298.8} [155.8 to 259.3]	17.6 to 29.3 {179.5 to 298.8} [155.8 to 259.3]	17.6 to 29.3 {179.5 to 298.8} [155.8 to 259.3]	—	14.9 to 24.8 {151.9 to 252.9} [131.9 to 219.5]
200 (8.0)50 (2.0)	23.4 to 39.0 {238.6 to 397.7} [207.1 to 345.2]4.5	23.4 to 39.0 {238.6 to 397.7} [207.1 to 345.2]4.5	23.4 to 39.0 {238.6 to 397.7} [207.1 to 345.2]	18.6 to 31.6 {189.7 to 322.2} [164.6 to 279.7]4.8	18.6 to 31.6 {189.7 to 322.2} [164.6 to 279.7]4.8	18.6 to 31.6 {189.7 to 322.2} [164.6 to 279.7]	— 4.3 to 7.1	17.1 to 28.6 {174.4 to 291.6} [151.3 to 253.1]

T0309.EPS

Table 3.3.9 WaferStyle Tightening Torque Values for Metal Piping and Permeable Fluids

Tightening torque values for PFA lining type

Unit: N-m {kgf-cm} [in-lbf]

Gasket types within flowtube	No gasket (standard)							
Gasket types for user's flange	PTFE-sheathed non-asbestos gasket (optional codes BCF and BSF), or the equivalent in hardness							
Size / Flange ratings mm (inch)	JIS 10K	ANSI Class 150	DIN PN10	JIS20K	ANSI Class 300	DIN PN16	DIN PN40	JIS F12 (JIS 75M)
50 (2.0)	66.2 to 76.1 {675.1 to 776.0} [585.9 to 673.5]	66.2 to 76.1 {675.1 to 776.0} [585.9 to 673.5]	—	33.1 to 38.0 {337.5 to 387.5} [292.9 to 336.3]	33.1 to 38.0 {337.5 to 387.5} [292.9 to 336.3]	—	71.2 to 118.6 {726.0 to 1209} [630.1 to 1050]	—
65 (2.5)	89.5 to 102.9 {912.6 to 1049} [792.1 to 910.7]	89.5 to 102.9 {912.6 to 1049} [792.1 to 910.7]	—	44.9 to 51.6 {457.9 to 526.2} [397.4 to 456.7]	44.9 to 51.6 {457.9 to 526.2} [397.4 to 456.7]	81.8 to 103.2 {834.1 to 1052} {724.0 to 913.4}	—	—
80 (3.0)	51.3 to 59.0 {523.1 to 601.6} [454.0 to 522.2]	111.3 to 118.4 {1135 to 1207} [985.0 to 1048]	—	58.1 to 66.8 {592.5 to 681.2} [514.2 to 591.2]	58.1 to 66.8 {592.5 to 681.2} [514.2 to 591.2]	58.1 to 66.8 {592.5 to 681.2} {514.2 to 591.2]	—	100.8 to 115.9 {1028 to 1182} [892.1 to 1026]
100 (4.0)	66.7 to 76.7 {680.2 to 782.1} [590.3 to 678.8]	66.7 to 76.7 {680.2 to 782.1} [590.3 to 678.8]	—	76.1 to 87.5 {776.0 to 892.3} [673.5 to 774.4]	76.1 to 87.5 {776.0 to 892.3} [673.5 to 774.4]	76.1 to 87.5 {776.0 to 892.3} {673.5 to 774.4]	—	129.8 to 149.3 {1324 to 1522} [1149 to 1321]
125 (5.0)	106.1 to 122.0 {1082 to 1244} [939.0 to 1080]	106.1 to 122.0 {1082 to 1244} [939.0 to 1080]	—	114.5 to 131.7 {1168 to 1343} [1013 to 1166]	114.5 to 131.7 {1168 to 1343} [1013 to 1166]	114.5 to 131.7 {1168 to 1343} {1013 to 1166]	—	109.6 to 126.0 {1118 to 1285} [970.0 to 1115]
150 (6.0)	122.2 to 140.5 {1246 to 1433} [1082 to 1243]	122.2 to 140.5 {1246 to 1433} [1082 to 1243]	—	86.8 to 99.8 {885.1 to 1018} [768.2 to 883.3]	86.8 to 99.8 {885.1 to 1018} [768.2 to 883.3]	129.8 to 136.9 {1324 to 1396} {1149 to 1212]	—	125.6 to 144.4 {1281 to 1472} [1112 to 1278]
200 (8.0)	111.6 to 128.3 {1138 to 1308} [987.7 to 1136]	161.0 to 192.3 {1642 to 1961} [1425 to 1702]	161.0 to 192.3 {1642 to 1961} [1425 to 1702]	122.0 to 140.3 {1244 to 1431} [1080 to 1242]	122.0 to 140.3 {1244 to 1431} [1080 to 1242]	122.0 to 140.3 {1244 to 1431} {1080 to 1242]	—	128.0 to 147.2 {1305 to 1501} [1133 to 1303]
250 (10)	167.7 to 192.9 {1710 to 1967} [1484 to 1707]	167.7 to 192.9 {1710 to 1967} [1484 to 1707]	167.7 to 192.9 {1710 to 1967} [1484 to 1707]	—	—	—	—	227.6 to 261.7 {2321 to 2669} [2014 to 2316]
300 (12)50 (2.0)	115.2 to 137.6 {1175 to 1403} [1020 to 1218]66.2	146.0 to 167.9 {1489 to 1712} [1292 to 1486]66.2	146.0 to 167.9 {1489 to 1712} [1292 to 1486]	—33.1 to 38.0 {337.5 to 387.5}	—33.1 to 38.0 {337.5 to 387.5}	— —	—71.2 to 118.6 {726.0 to 1209}	209.1 to 240.5 {2132 to 2452} [1851 to 2129]

Tightening torque values for Ceramics lining type

Unit: N-m {kgf-cm} [in-lbf]

Gasket types within flowtube	Fluororesin with ceramic fillers (Valqua #7020) gasket (standard), or fluororesin with carbon gasket (optional code GF)							
Gasket types for user's flange	PTFE-sheathed non-asbestos gasket (optional codes BCF and BSF), or the equivalent in hardness							
Size / Flange ratings mm (inch)	JIS 10K	ANSI Class 150	DIN PN10	JIS20K	ANSI Class 300	DIN PN16	DIN PN40	JIS F12 (JIS 75M)
50 (2.0)	29.9 to 49.8 {304.9 to 507.8} [264.6 to 440.8]	29.9 to 49.8 {304.9 to 507.8} [264.6 to 440.8]	—	30.5 to 50.9 {311.0 to 519.0} [269.9 to 450.5]	30.5 to 50.9 {311.0 to 519.0} [269.9 to 450.5]	—	32.7 to 54.5 {333.4 to 555.7} [289.4 to 482.4]	—
80 (3.0)	48.5 to 80.8 {494.6 to 823.9} [429.3 to 715.1]	48.5 to 80.8 {494.6 to 823.9} [429.3 to 715.1]	—	46.6 to 77.6 {475.2 to 791.3} [412.4 to 686.8]	46.6 to 77.6 {475.2 to 791.3} [412.4 to 686.8]	46.6 to 77.6 {475.2 to 791.3} [412.4 to 686.8]	—	56.3 to 93.8 {574.1 to 956.5} [498.3 to 830.2]
100 (4.0)	60.5 to 100.9 {616.9 to 1029} [535.5 to 893.0]	60.5 to 100.9 {616.9 to 1029} [535.5 to 893.0]	—	61.5 to 102.5 {627.1 to 1045} [544.3 to 907.2]	61.5 to 102.5 {627.1 to 1045} [544.3 to 907.2]	61.5 to 102.5 {627.1 to 1045} [544.3 to 907.2]	—	74.2 to 123.7 {756.6 to 1261} [656.7 to 1095]
150 (6.0)	125.0 to 208.3 {1275 to 2124} [1106 to 1844]	125.0 to 208.3 {1275 to 2124} [1106 to 1844]	—	128.0 to 213.3 {1305 to 2175} [1133 to 1888]	128.0 to 213.3 {1305 to 2175} [1133 to 1888]	128.0 to 213.3 {1305 to 2175} [1133 to 1888]	—	82.2 to 137.0 {838.2 to 1397} [727.5 to 1213]
200 (8.0)50 (2.0)	174.7 to 291.2 {1781 to 2969} [1546 to2577]29.9 to	174.7 to 291.2 {1781 to 2969} [1546 to2577]29.9 to	174.7 to 291.2 {1781 to 2969} [1546 to2577]	120.1 to 200.2 {1225 to 2041} [1063 to 1772]30.5	120.1 to 200.2 {1225 to 2041} [1063 to 1772]30.5	120.1 to 200.2 {1225 to 2041} [1063 to 1772]	— 32.7 to 54.5	86.7 to 144.6 {884.1 to 1475} [767.3 to 1280]

T0310.EPS

Table 3.3.10 Centering Device Identification (AXF standard models, PFA/polyurethane lining)

Size / Flange ratings mm (in.)	ANSI		DIN		
	150	300	PN10	PN16	PN40
50 (2.0)	B	F	—	—	F
65 (2.5)	B	G	—	F	—
80 (3.0)	F	C	—	G	—
100 (4.0)	C	H	—	F	—
125 (5.0)	G	D	—	F	—
150 (6.0)	C	E	—	C	—
200 (8.0)	D	E	C	C	—
250 (10)	N	—	C	C	—
300 (12)	P	—	C	C	—

*: Each centering device is engraved with a character as identification.

T0311.EPS

Table 3.3.11 Centering Device Identification (AXF standard models, ceramics lining)

Size / Flange ratings mm (in.)	ANSI		DIN		
	150	300	PN10	PN16	PN40
50 (2.0)	B	F	—	—	F
80 (3.0)	F	C	—	G	—
100 (4.0)	C	H	—	F	—
150 (6.0)	B	D	—	B	—
200 (8.0)	G	J	B	B	—

*: Each centering device is engraved with a character as identification.

T0312-1.EPS

Table 3.3.12 Centering Device Identification (replacement models, PFA/polyurethane rubber lining)

Size mm (in.) \ Flange ratings	ANSI		DIN		
	150	300	PN10	PN16	PN40
50 (2.0)	B	F	—	—	F
80 (3.0)	F	C	—	G	—
100 (4.0)	C	H	—	F	—
150 (6.0)	C	E	—	C	—
200 (8.0)	D	E	C	C	—

*: Each centering device is engraved with a character as identification.

T0312-2.EPS

Table 3.3.13 Inner Diameters of Grounding Ring

Unit: mm (in.)

Size mm (in.)	AXF standard models			Replacement models for earlier ADMAG or ADMAG AE
	PFA/Polyurethane Rubber/ Natural Soft Rubber/ EPDM Rubber		Ceramics lining	PFA/polyurethane rubber lining
	Wafer	Flange		
2.5 (0.1)	15 (0.59) (*1)		—	15 (0.59)
5 (0.2)	15 (0.59) (*1)		—	15 (0.59)
10 (0.4)	15 (0.59) (*1)		—	15 (0.59)
15 (0.5)	15 (0.59) (*1)		15 (0.59)	15 (0.59)
25 (1.0)	28 (1.10)		27 (1.06)	27 (1.06)
32 (1.25)	34 (1.34)		—	—
40 (1.5)	41 (1.61)		40 (1.57)	40 (1.57)
50 (2.0)	53 (2.09)		52 (2.05)	52 (2.05)
65 (2.5)	66 (2.60)		—	—
80 (3.0)	77 (3.03)		81 (3.19)	81 (3.19)
100 (4.0)	102 (4.02)		98 (3.86)	98 (3.86)
125 (5.0)	128 (5.04)		—	—
150 (6.0)	146.1 (5.75)		144 (5.67)	140.7 (5.6)
200 (8.0)	193.6 (7.62)		192 (7.56)	188.9 (7.5)
250 (10)	243.7 (9.60)	243 (9.57)	—	239.1 (9.41)
300 (12)	294.7 (11.60)	291.3 (11.47)	—	—
350 (14)	—	323.4 (12.73)	—	—
400 (16)	—	373.5 (14.70)	—	—

*1: The inner diameter of the process connection code: DD4, DJ1, DJ2 is 12 mm (0.47 in.)

Note: Be sure that inner diameter of the piping-side gasket does not protrude into the inner diameter of the grounding ring. (This dimension is also applied when no grounding ring is used.) If the inner diameter of the gasket is too large, however, fluid leakage may result.

T0313.EPS

3.3.4 Nominal Diameter 2.5 mm (0.1 in.) to 400 mm (16 in.), Flange Style

IMPORTANT

Use bolts and nuts in compliance with the flange ratings. Be sure to choose a gasket with an inner diameter that does not protrude inside the piping (refer to Table 3.3.13). If the inner diameter of the gasket is too large, however, fluid leakage may result.

(1) Mounting Direction

Mount the flowmeter so that the flow direction of the fluid to be measured is in line with the direction of the arrow mark on the flowmeter.

IMPORTANT

If it is impossible to match the direction of the arrow mark, the direction of the electrical connection can be changed. Refer to Section 5.1 to do this properly.
In case the fluid being measured flows against the arrow direction, refer to the parameter **J20: Flow Direction** in the user's manual of the AXFA11 Magnetic Flowmeter Remote Converter (IM 01R20C01-01E-E) or the AXFA14 Magnetic Flowmeter Remote Converter/AXF Integral Flowmeter [Software Edition] (IM 01R20C02-01E-E).

(2) Tightening Nuts

Tighten the bolts according to the torque values for the metal piping in Table 3.3.14. For PVC piping, select an option code of /GA, /GC, or /GD, use rubber gaskets and tighten the nuts to the torque values for the PVC piping in Table 3.3.15.
For permeable fluids (such as nitric acid, hydrofluoric acid, or sodium hydrate at high temperatures), tighten the nuts according to the torque values in Table 3.3.16.

CAUTION

For a flowmeter with fluorocarbon PFA lining, it is possible that the nuts may loosen as time passes, so tighten them regularly. Be sure to tighten the nuts according to the prescribed torque values. Tighten them diagonally with the same torque values, step by step up to the prescribed torque value.

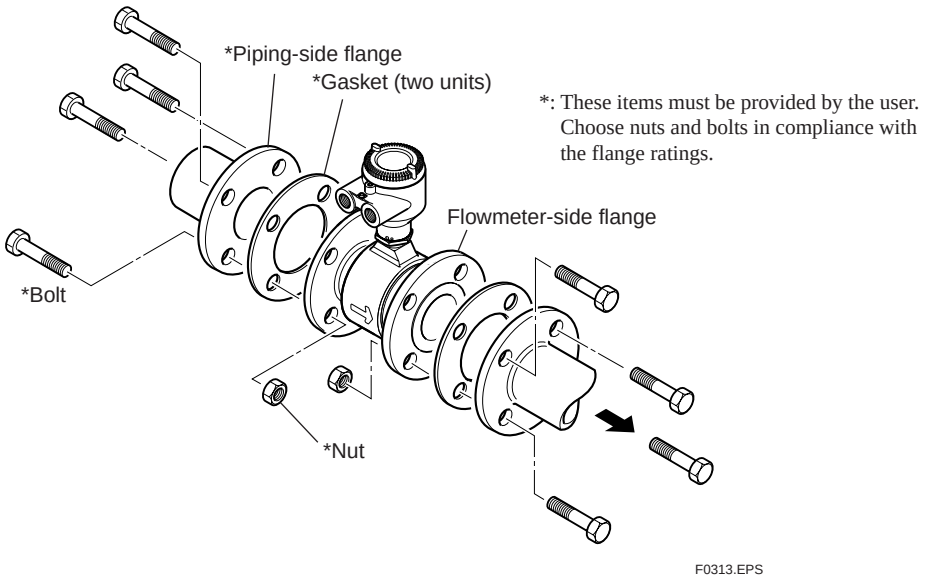

*Piping-side flange
*Gasket (two units)
*: These items must be provided by the user. Choose nuts and bolts in compliance with the flange ratings.
Flowmeter-side flange
*Bolt
*Nut
F0313.EPS

Figure 3.3.5 Mounting Procedure for Flange Style (size: 2.5 mm (0.1 in.) to 400 mm (16 in.))

Table 3.3.14 Flange Style Tightening Torque Values for Metal Piping

Tightening torque values for PFA/Polyurethane Rubber/Natural Soft Rubber/EPDM Rubber lining type	Unit: N-m {kgf-cm} [in-lbf]							
Gasket types within flowtube	**No gasket (standard)**							
Gasket types for user's flange	**Non-asbestos gasket, PTFE-sheathed non-asbestos gasket, or the equivalent in hardness**							
Size / Flange ratings mm (inch)	**JIS 10K**	**ANSI Class 150**	**DIN PN10**	**JIS20K**	**ANSI Class 300**	**DIN PN16**	**DIN PN40**	**JIS F12 (JIS 75M)**
2.5 (0.1) (with 10-mm flanges)	3.8 to 6.3 {38.75 to 64.24} [33.63 to 55.76]	3.8 to 6.3 {38.75 to 64.24} [33.63 to 55.76]	—	3.8 to 6.3 {38.75 to 64.24} [33.63 to 55.76]	3.8 to 6.3 {38.75 to 64.24} [33.63 to 55.76]	—	3.8 to 6.4 {38.75 to 65.26} [33.63 to 56.64]	—
2.5 (0.1) (with 15-mm flanges)	4.6 to 7.7 {46.91 to 78.52} [40.71 to 68.15]	4.6 to 7.7 {46.91 to 78.52} [40.71 to 68.15]	—	4.7 to 7.8 {47.93 to 79.54} [41.6 to 69.03]	4.7 to 7.8 {47.93 to 79.54} [41.6 to 69.03]	—	4.7 to 7.9 {47.93 to 80.56} [41.6 to 69.92]	—
5 (0.2) (with 10-mm flanges)	3.8 to 6.3 {38.75 to 64.24} [33.63 to 55.76]	3.8 to 6.3 {38.75 to 64.24} [33.63 to 55.76]	—	3.8 to 6.3 {38.75 to 64.24} [33.63 to 55.76]	3.8 to 6.3 {38.75 to 64.24} [33.63 to 55.76]	—	3.8 to 6.4 {38.75 to 65.26} [33.63 to 56.64]	—
5 (0.2) (with 15-mm flanges)	4.6 to 7.7 {46.91 to 78.52} [40.71 to 68.15]	4.6 to 7.7 {46.91 to 78.52} [40.71 to 68.15]	—	4.7 to 7.8 {47.93 to 79.54} [41.6 to 69.03]	4.7 to 7.8 {47.93 to 79.54} [41.6 to 69.03]	—	4.7 to 7.9 {47.93 to 80.56} [41.6 to 69.92]	—
10 (0.4) (with 10-mm flanges)	3.8 to 6.3 {38.75 to 64.24} [33.63 to 55.76]	3.8 to 6.3 {38.75 to 64.24} [33.63 to 55.76]	—	3.8 to 6.3 {38.75 to 64.24} [33.63 to 55.76]	3.8 to 6.3 {38.75 to 64.24} [33.63 to 55.76]	—	3.8 to 6.4 {38.75 to 65.26} [33.63 to 56.64]	—
10 (0.4) (with 15-mm flanges)	4.6 to 7.7 {46.91 to 78.52} [40.71 to 68.15]	4.6 to 7.7 {46.91 to 78.52} [40.71 to 68.15]	—	4.7 to 7.8 {47.93 to 79.54} [41.6 to 69.03]	4.7 to 7.8 {47.93 to 79.54} [41.6 to 69.03]	—	4.7 to 7.9 {47.93 to 80.56} [41.6 to 69.92]	—
15 (0.5)	4.6 to 7.7 {46.91 to 78.52} [40.71 to 68.15]	4.6 to 7.7 {46.91 to 78.52} [40.71 to 68.15]	—	4.7 to 7.8 {47.93 to 79.54} [41.6 to 69.03]	4.7 to 7.8 {47.93 to 79.54} [41.6 to 69.03]	—	4.7 to 7.9 {47.93 to 80.56} [41.6 to 69.92]	—
25 (1.0)	13.1 to 15.1 {133.6 to 154.0} [115.9 to 133.6]	13.1 to 15.1 {133.6 to 154.0} [115.9 to 133.6]	—	13.2 to 15.2 {134.6 to 155.0} [116.8 to 134.5]	13.2 to 15.2 {134.6 to 155.0} [116.8 to 134.5]	—	11.9 to 13.7 {121.3 to 139.7} [105.3 to 121.3]	—
32 (1.25)	14.4 to 15.6 {146.8 to 159.1} [127.4 to138.1]	14.4 to 15.6 {146.8 to 159.1} [127.4 to138.1]	—	14.6 to 16.8 {148.9 to 171.3} [129.2 to 148.7]	14.6 to 16.8 {148.9 to 171.3} [129.2 to 148.7]	—	15.0 to 17.3 {153.0 to 176.4} [132.8 to 153.1]	—
40 (1.5)	21.9 to 25.2 {223.3 to 257.0} [193.8 to 223.0]	21.9 to 25.2 {223.3 to 257.0} [193.8 to 223.0]	—	22.2 to 25.5 {226.4 to 260.0} [196.5 to 225.7]	22.2 to 25.5 {226.4 to 260.0} [196.5 to 225.7]	—	23.2 to 26.7 {236.6 to 272.3} [205.3 to 236.3]	—
50 (2.0)	28.0 to 32.2 {285.5 to 328.3} [247.8 to 285.0]	28.0 to 32.2 {285.5 to 328.3} [247.8 to 285.0]	—	27.8 to 32.0 {283.5 to 326.3} [246.0 to 283.2]	27.8 to 32.0 {283.5 to 326.3} [246.0 to 283.2]	—	28.8 to 33.1 {293.7 to 337.5} [254.9 to 293.0]	—
65 (2.5)	41.6 to 47.8 {424.2 to 487.4} [368.2 to 423.0]	41.6 to 47.8 {424.2 to 487.4} [368.2 to 423.0]	—	19.5 to 28.5 {198.8 to 290.6} [172.6 to 252.2]	19.5 to 28.5 {198.8 to 290.6} [172.6 to 252.2]	41.4 to 47.6 {422.2 to 485.4} [366.4 to 421.3]	—	—
80 (3.0)	23.2 to 26.7 {236.6 to 272.3} [205.3 to 236.3]	52.7 to 53.6 {536.9 to 546.2} [466.0 to 474.1]	—	26.1 to 30.0 {266.1 to 305.9} [231.0 to 265.5]	26.1 to 30.0 {266.1 to 305.9} [231.0 to 265.5]	26.1 to 30.0 {266.1 to 305.9} [231.0 to 265.5]	—	46.0 to 52.9 {469.1 to 539.4} [407.1 to 468.2]
100 (4.0)	30.9 to 35.5 {315.1 to 362.0} [273.5 to 314.2]	30.9 to 35.5 {315.1 to 362.0} [273.5 to 314.2]	—	34.8 to 40.0 {354.9 to 407.9} [308.0 to 354.0]	34.8 to 40.0 {354.9 to 407.9} [308.0 to 354.0]	34.8 to 40.0 {354.9 to 407.9} [308.0 to 354.0]	—	60.9 to 70.0 {621.0 to 713.8} [539.0 to 619.5]
125 (5.0)	45.6 to 52.4 {465.0 to 534.3} [403.6 to 463.8]	45.6 to 52.4 {465.0 to 534.3} [403.6 to 463.8]	—	48.6 to 55.9 {495.6 to 570.0} [430.1 to 494.7]	48.6 to 55.9 {495.6 to 570.0} [430.1 to 494.7]	48.6 to 55.9 {495.6 to 570.0} [430.1 to 494.7]	—	48.1 to 55.3 {490.5 to 563.9} [425.7 to 489.4]
150 (6.0)	64.5 to 74.2 {657.7 to 756.6} [570.8 to 656.7]	64.5 to 74.2 {657.7 to 756.6} [570.8 to 656.7]	—	44.8 to 51.5 {456.8 to 525.2} [396.5 to 455.8]	44.8 to 51.5 {456.8 to 525.2} [396.5 to 455.8]	66.7 to 80.8 {680.2 to 823.9} [590.3 to 715.1]	—	67.5 to 77.6 {688.3 to 791.3} [597.4 to 686.8]
200 (8.0)	59.2 to 68.1 {603.7 to 694.4} [523.9 to 602.7]	100.3 to 102.1 {1023 to 1041} [887.8 to 903.3]	100.3 to 102.1 {1023 to 1041} [887.8 to 903.3]	63.6 to 73.1 {648.5 to 745.4} [562.9 to 647.0]	63.6 to 73.1 {648.5 to 745.4} [562.9 to 647.0]	63.6 to 73.1 {648.5 to 745.4} [562.9 to 647.0]	—	69.9 to 80.4 {712.8 to 819.9} [618.6 to 711.6]
250 (10)	144.0 to 165.6 {1468 to 1689} [1274 to 1466]	144.0 to 165.6 {1468 to 1689} [1274 to 1466]	144.0 to 165.6 {1468 to 1689} [1274 to 1466]	156.3 to 179.7 {1594 to 1832} [1383 to 1590]	127.2 to 148.8 {1297 to 1517} [1126 to 1317]	156.3 to 179.7 {1594 to 1832} [1383 to 1590]	—	190.5 to 219.1 {1943 to 2234} [1686 to 1939]
300 (12)	119.3 to 137.2 {1217 to 1399} [1056 to 1214]	163.1 to 197.4 {1663 to 2013} [1443 to 1747]	163.1 to 197.4 {1663 to 2013} [1443 to 1747]	123.1 to 136.3 {1255 to 1390} [1089 to 1206]	152.3 to 169.4 {1553 to 1727} [1348 to 1499]	173.3 to 199.3 {1767 to 2032} [1534 to 1764]	—	168.0 to 193.2 {1713 to 1970} [1487 to 1710]
350 (14)	164.7 to 189.4 {1679 to 1931} [1458 to 1676]	256.4 to 293.3 {2615 to 2991} [2269 to 2596]	164.7 to 189.4 {1679 to 1931} [1458 to 1676]	—	—	—	—	238.6 to 274.4 {2433 to 2798} [2112 to 2429]
400 (16)	225.2 to 258.9 {2296 to 2640} [1993 to 2291]	225.2 to 258.9 {2296 to 2640} [1993 to 2291]	225.2 to 258.9 {2296 to 2640} [1993 to 2291]	—	—	—	—	305.8 to 351.7 {3118 to 3586} [2706 to 3113]

T0314.EPS

Table 3.3.15 Flange Style Tightening Torque Values for PVC Piping

Tightening torque values for PFA lining type								Unit: N·m {kgf-cm} [in-lbf]
Gasket types within flowtube	**Fluororubber gasket (optional codes GA, GC, and GD)**							
Gasket types for user's flange	**Fluororubber gasket, chloroprene rubber gasket, or the equivalent in hardness**							
Size mm (inch) \ Flange ratings	**JIS 10K**	**ANSI Class 150**	**DIN PN10**	**JIS20K**	**ANSI Class 300**	**DIN PN16**	**DIN PN40**	**JIS F12 (JIS 75M)**
2.5 (0.1) (with 10-mm flanges)	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	—	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	—	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	—
2.5 (0.1) (with 15-mm flanges)	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	—	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	—	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	—
5 (0.2) (with 10-mm flanges)	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	—	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	—	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	—
5 (0.2) (with 15-mm flanges)	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	—	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	—	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	—
10 (0.4) (with 10-mm flanges)	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	—	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	—	0.8 to 1.3 {8.158 to 13.26} [7.08 to 11.51]	—
10 (0.4) (with 15-mm flanges)	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	—	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	—	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	—
15 (0.5)	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	—	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	—	0.9 to 1.6 {9.177 to 16.32} [7.966 to 14.16]	—
25 (1.0)	2.7 to 4.5 {27.53 to 45.89} [23.9 to 39.83]	2.7 to 4.5 {27.53 to 45.89} [23.9 to 39.83]	—	2.7 to 4.5 {27.53 to 45.89} [23.9 to 39.83]	2.7 to 4.5 {27.53 to 45.89} [23.9 to 39.83]	—	2.3 to 3.9 {23.45 to 39.77} [20.36 to 34.52]	—
32 (1.25)	3.0 to 4.9 {30.59 to 49.97} [26.55 to 43.37]	3.0 to 4.9 {30.59 to 49.97} [26.55 to 43.37]	—	3.0 to 5.0 {30.59 to 50.99} [26.55 to 44.25]	3.0 to 5.0 {30.59 to 50.99} [26.55 to 44.25]	—	2.9 to 4.9 {29.57 to 49.97} [25.67 to 43.37]	—
40 (1.5)	4.5 to 7.6 {45.89 to 77.5} [39.83 to 67.26]	4.5 to 7.6 {45.89 to 77.5} [39.83 to 67.26]	—	4.7 to 7.8 {47.93 to 79.54} [41.6 to 69.03]	4.7 to 7.8 {47.93 to 79.54} [41.6 to 69.03]	—	4.4 to 7.4 {44.87 to 75.46} [38.94 to 65.49]	—
50 (2.0)	5.9 to 9.8 {60.16 to 99.93} [52.22 to 86.74]	5.9 to 9.8 {60.16 to 99.93} [52.22 to 86.74]	—	2.9 to 4.8 {29.57 to 48.95 } [25.67 to 42.48]	2.9 to 4.8 {29.57 to 48.95 } [25.67 to 42.48]	—	5.5 to 9.2 {56.08 to 93.81 } [48.68 to 81.43]	—
65 (2.5)	9.0 to 15.0 {91.8 to 153.0} [79.7 to 132.8]	9.0 to 15.0 {91.8 to 153.0} [79.7 to 132.8]	—	2.1 to 4.4 {21.4 to 44.9} [18.6 to 38.9]	2.1 to 4.4 {21.4 to 44.9} [18.6 to 38.9]	4.4 to 7.3 {44.9 to 74.4} [38.9 to 64.6]	—	—
80 (3.0)	4.9 to 8.1 {50.0 to 82.6} [43.4 to 71.7]	11.1 to 16.3 {113.2 to 166.2} [98.2 to 144.3]	—	5.5 to 9.1 {56.1 to 92.8} [48.7 to 80.5]	5.5 to 9.1 {56.1 to 92.8} [48.7 to 80.5]	5.5 to 9.1 {56.1 to 92.8} [48.7 to 80.5]	—	9.7 to 12.2 {98.9 to 124.4} [85.8 to 108.0]
100 (4.0)	6.7 to 11.2 {68.3 to 114.2} [59.3 to 99.1]	6.7 to 11.2 {68.3 to 114.2} [59.3 to 99.1]	—	7.5 to 12.6 {76.5 to 128.5} [66.4 to 111.5]	7.5 to 12.6 {76.5 to 128.5} [66.4 to 111.5]	7.5 to 12.6 {76.5 to 128.5} [66.4 to 111.5]	—	13.3 to 22.2 {135.6 to 226.4} [117.7 to 196.5]
125 (5.0)	9.9 to 16.5 {101.0 to 168.3} [87.6 to 146.0]	9.9 to 16.5 {101.0 to 168.3} [87.6 to 146.0]	—	10.7 to 17.8 {109.1 to 181.5} [94.7 to 157.5]	10.7 to 17.8 {109.1 to 181.5} [94.7 to 157.5]	10.7 to 17.8 {109.1 to 181.5} [94.7 to 157.5]	—	10.5 to 17.6 {107.1 to 179.5} [92.9 to 155.8]
150 (6.0)	14.4 to 24.0 {146.8 to 244.7} [127.4 to 212.4]	14.4 to 24.0 {146.8 to 244.7} [127.4 to 212.4]	—	9.8 to 16.3 {99.9 to 166.2} [86.7 to 144.3]	9.8 to 16.3 {99.9 to 166.2} [86.7 to 144.3]	14.6 to 25.6 {148.9 to 261.0} [129.2 to 226.6]	—	15.2 to 25.3 {155.0 to 258.0} [134.5 to 223.9]
200 (8.0)	13.4 to 22.3 {136.6 to 227.4} [118.6 to 197.4]	22.7 to 33.4 {231.5 to 340.6} [200.9 to 295.6]	22.7 to 33.4 {231.5 to 340.6} [200.9 to 295.6]	14.6 to 24.3 {148.9 to 247.8} [129.2 to 215.1]	14.6 to 24.3 {148.9 to 247.8} [129.2 to 215.1]	14.6 to 24.3 {148.9 to 247.8} [129.2 to 215.1]	—	16.1 to 26.9 {164.2 to 274.3} [142.5 to 238.1]

T0315.EPS

Table 3.3.16 Flange Style Tightening Torque Values for Metal Piping and Permeable Fluids

Tightening torque values for PFA lining type								Unit: N-m {kgf-cm} [in-lbf]
Gasket types within flowtube	**No gasket (standard)**							
Gasket types for user's flange	**Non-asbestos gasket, PTFE-sheathed non-asbestos gasket, or the equivalent in hardness**							
Size mm (inch) \ Flange ratings	**JIS 10K**	**ANSI Class 150**	**DIN PN10**	**JIS20K**	**ANSI Class 300**	**DIN PN16**	**DIN PN40**	**JIS F12 (JIS 75M)**
2.5 (0.1) (with 10-mm flanges)	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	—	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	—	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	—
2.5 (0.1) (with 15-mm flanges)	6.9 to 7.9 {70.36 to 80.56} [61.07 to 69.92]	6.9 to 7.9 {70.36 to 80.56} [61.07 to 69.92]	—	7.0 to 8.1 {71.38 to 82.6} [61.95 to 71.69]	7.0 to 8.1 {71.38 to 82.6} [61.95 to 71.69]	—	7.0 to 8.1 {71.38 to 82.6} [61.95 to 71.69]	—
5 (0.2) (with 10-mm flanges)	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	—	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	—	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	—
5 (0.2) (with 15-mm flanges)	6.9 to 7.9 {70.36 to 80.56} [61.07 to 69.92]	6.9 to 7.9 {70.36 to 80.56} [61.07 to 69.92]	—	7.0 to 8.1 {71.38 to 82.6} [61.95 to 71.69]	7.0 to 8.1 {71.38 to 82.6} [61.95 to 71.69]	—	7.0 to 8.1 {71.38 to 82.6} [61.95 to 71.69]	—
10 (0.4) (with 10-mm flanges)	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	—	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	—	5.7 to 6.6 {58.12 to 67.3} [50.45 to 58.41]	—
10 (0.4) (with 15-mm flanges)	6.9 to 7.9 {70.36 to 80.56} [61.07 to 69.92]	6.9 to 7.9 {70.36 to 80.56} [61.07 to 69.92]	—	7.0 to 8.1 {71.38 to 82.6} [61.95 to 71.69]	7.0 to 8.1 {71.38 to 82.6} [61.95 to 71.69]	—	7.0 to 8.1 {71.38 to 82.6} [61.95 to 71.69]	—
15 (0.5)	6.9 to 7.9 {70.36 to 80.56} [61.07 to 69.92]	6.9 to 7.9 {70.36 to 80.56} [61.07 to 69.92]	—	7.0 to 8.1 {71.38 to 82.6} [61.95 to 71.69]	7.0 to 8.1 {71.38 to 82.6} [61.95 to 71.69]	—	7.0 to 8.1 {71.38 to 82.6} [61.95 to 71.69]	—
25 (1.0)	19.6 to 22.5 {199.9 to 229.4} [173.5 to 199.1]	19.6 to 22.5 {199.9 to 229.4} [173.5 to 199.1]	—	19.7 to 22.7 {200.9 to 231.5} [174.4 to 200.9]	19.7 to 22.7 {200.9 to 231.5} [174.4 to 200.9]	—	17.5 to 20.1 {178.5 to 205.0} [154.9 to 177.9]	—
32 (1.25)	21.5 to 24.7 {219.2 to 251.9} [190.3 to 218.6]	21.5 to 24.7 {219.2 to 251.9} [190.3 to 218.6]	—	21.6 to 24.8 {220.3 to 252.9} [191.2 to 219.5]	21.6 to 24.8 {220.3 to 252.9} [191.2 to 219.5]	—	22.1 to 25.4 {225.4 to 259.0} [195.6 to 224.8]	—
40 (1.5)	32.5 to 37.4 {331.4 to 381.4} [287.6 to 331.0]	32.5 to 37.4 {331.4 to 381.4} [287.6 to 331.0]	—	32.8 to 37.7 {334.5 to 384.4} [290.3 to 333.7]	32.8 to 37.7 {334.5 to 384.4} [290.3 to 333.7]	—	33.8 to 38.9 {344.7 to 396.7} [229.2 to 344.3]	—
50 (2.0)	41.3 to 47.5 {421.1 to 484.4} [365.5 to 420.4]	41.3 to 47.5 {421.1 to 484.4} [365.5 to 420.4]	—	20.6 to 23.7 {210.1 to 241.7} [182.3 to 209.8]	20.6 to 23.7 {210.1 to 241.7} [182.3 to 209.8]	—	42.2 to 48.5 {430.3 to 494.6} [373.5 to 429.3]	—
65 (2.5)	61.2 to 70.4 {624.1 to 717.9} [541.6 to 623.1]	61.2 to 70.4 {624.1 to 717.9} [541.6 to 623.1]	—	14.3 to 21.0 {145.8 to 214.1} [126.6 to 185.9]	14.3 to 21.0 {145.8 to 214.1} [126.6 to 185.9]	30.5 to 35.1 {311.0 to 357.9} [269.9 to 310.6]	—	—
80 (3.0)	34.2 to 39.3 {348.7 to 400.7} [302.7 to 347.8]	77.6 to 78.8 {791.3 to 803.5} [686.8 to 697.4]	—	38.5 to 44.3 {392.6 to 451.7} [340.7 to 392.1]	38.5 to 44.3 {392.6 to 451.7} [340.7 to 392.1]	38.5 to 44.3 {392.6 to 451.7} [340.7 to 392.1]	—	68.1 to 78.3 {694.4 to 798.4} [602.7 to 693.0]
100 (4.0)	45.2 to 52.0 {460.9 to 530.3} [400.0 to 460.2]	45.2 to 52.0 {460.9 to 530.3} [400.0 to 460.2]	—	51.0 to 58.7 {520.1 to 598.6} [451.4 to 519.5]	51.0 to 58.7 {520.1 to 598.6} [451.4 to 519.5]	51.0 to 58.7 {520.1 to 598.6} [451.4 to 519.5]	—	89.6 to 103.0 {913.7 to 1050} [793.0 to 911.6]
125 (5.0)	66.8 to 76.8 {681.2 to 783.1} [591.2 to 679.7]	66.8 to 76.8 {681.2 to 783.1} [591.2 to 679.7]	—	70.8 to 81.4 {722.0 to 830.1} [626.6 to 720.4]	70.8 to 81.4 {722.0 to 830.1} [626.6 to 720.4]	70.8 to 81.4 {722.0 to 830.1} [626.6 to 720.4]	—	70.7 to 81.3 {720.9 to 829.0} [625.7 to 719.5]
150 (6.0)	93.9 to 108.8 {957.5 to 1109} [831.1 to 962.9]	93.9 to 108.8 {957.5 to 1109} [831.1 to 962.9]	—	65.4 to 75.2 {666.9 to 766.8} [578.8 to 665.5]	65.4 to 75.2 {666.9 to 766.8} [578.8 to 665.5]	97.3 to 118.0 {992.2 to 1203} [861.1 to 1044]	—	98.8 to 113.6 {1007 to 1158} [874.4 to 1005]
200 (8.0)	85.8 to 98.7 {874.9 to 1006} [759.4 to 873.5]	145.4 to 147.9 {1483 to 1508} [1287 to 1309]	145.4 to 147.9 {1483 to 1508} {1287 to 1309]	91.5 to 105.2 {933.0 to 1073} [809.8 to 931.1]	91.5 to 105.2 {933.0 to 1073} [809.8 to 931.1]	91.5 to 105.2 {933.0 to 1073} [809.8 to 931.1]	—	101.8 to 117.1 {1038 to 1194} [901.0 to 1036]
250 (10)	207.8 to 239.0 {2119 to 2437} [1839 to 2115]	207.8 to 239.0 {2119 to 2437} [1839 to 2115]	207.8 to 239.0 {2119 to 2437} {1839 to 2115]	222.9 to 256.3 {2273 to 2614} [1973 to 2268]	181.4 to 212.2 {1850 to 2164} [1605 to 1878]	222.9 to 256.3 {2273 to 2614} [1973 to 2268]	—	277.9 to 319.6 {2834 to 3259} [2460 to 2829]
300 (12)	171.0 to 196.7 {1744 to 2006} [1513 to 1741]	233.7 to 283.0 {2383 to 2886} [2068 to 2505]	233.7 to 283.0 {2383 to 2886} {2068 to 2505]	130.7 to 144.8 {1333 to 1477} [1157 to 1282]	161.8 to 180.0 {1650 to 1835} [1432 to 1593]	184.1 to 211.7 {1877 to 2159} [1629 to 1874]	—	243.8 to 280.4 {2486 to 2859} [2158 to 2482]
350 (14)	234.7 to 269.9 {2393 to 2752} [2077 to 2389]	365.4 to 418.0 {3726 to 4262} [3234 to 3699]	234.7 to 269.9 {2393 to 2752} {2077 to 2389]	—	—	—	—	350.6 to 403.2 {3575 to 4112} [3103 to 3568]
400 (16)	320.0 to 368.0 {3263 to 3753} [2832 to 3257]	320.0 to 368.0 {3263 to 3753} [2832 to 3257]	320.0 to 368.0 {3263 to 3753} {2832 to 3257]	—	—	—	—	448.3 to 515.5 {4571 to 5257} [3968 to 4562]

T0316.EPS

3.3.5 Sanitary Style

The sanitary type can be mounted to the piping using a clamp, a union, or a welded joint.

NOTE

This section describes the remote flowtube as an example. The same procedure also applies to the integral flowmeter.

(1) Mounting Direction

Mount the flowmeter so that the flow direction of the fluid to be measured is in line with the direction of the arrow mark on the flowmeter.

IMPORTANT

If it is impossible to match the direction of the arrow mark, the direction of the electrical connection can be changed. Refer to Section 5.1 to do this properly.
In case the fluid being measured flows against the arrow direction, refer to the parameter **J20: Flow Direction** in the user's manual of the AXFA11 Magnetic Flowmeter Remote Converter (IM 01R20C01-01E-E) or the AXFA14 Magnetic Flowmeter Remote Converter/AXF Integral Flowmeter [Software Edition] (IM 01R20C02-01E-E).

(2) Mounting Procedure

(a) Clamp style

(process connection code: HAB, HDB, and HKB)

1) Welding ferrule

Weld a ferrule to the piping.

IMPORTANT

When welding the ferrule, pay attention to the edge preparation, level differences between the ferrule and the piping, and the welding current to avoid deforming the piping or causing stagnation portion of the fluid.

2) Installing gasket

Install a gasket for clamp to fit in the groove on the ferrule.

3) Positioning flowmeter

Position the flowmeter between the two ferrules.

4) Tightening clamp

Install a clamp to cover the tapered parts of the flowmeter-side adapter and the ferrule, and tighten the clamp screw.

5) Confirmation of adapter mounting screw

After installation of the magnetic flowmeter, be sure to retighten the adapter mounting screw according to Table 3.3.20 or Table 3.3.21. Be sure to confirm that leakage from adapter connection point does not occur by filling the pipe of the flowtube with fluid.

NOTE

The ferrule, clamp, and gasket are not provided with the flowmeter, and must be provided by the user.

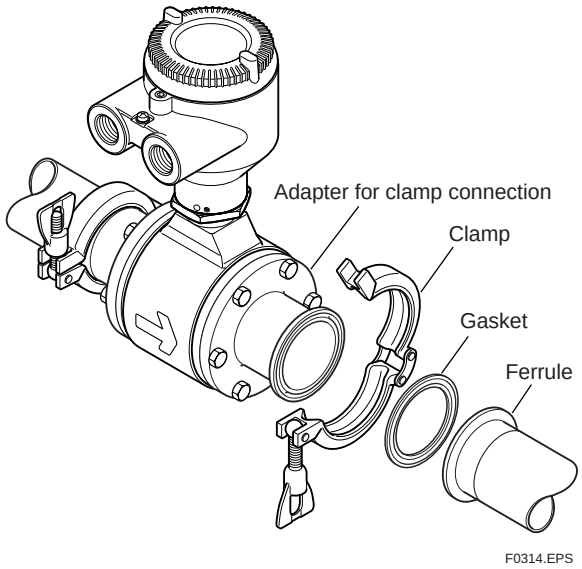


Figure 3.3.6 Mounting Procedure for Clamp Connection Style

(b) Union style

(process connection codes: JDB, JKB, and JSB)

1) Welding sleeve

Pass the piping through a nut and then weld a sleeve to the piping.

IMPORTANT

- Be sure to weld the sleeve after passing the piping through the nut.
- When welding the sleeve, pay attention to the edge preparation, level differences between the sleeve and the piping, and the welding current to avoid deforming the piping or causing stagnation of some of the fluid.

2) Installing gasket

Install a gasket for union to fit in the groove on the sleeve.

3) Positioning flowmeter

Move the nut closer to the piping temporarily and position the flowmeter between the two sleeves.

4) Tightening nut

Install the nut to cover the tapered parts of the flowmeter-side adapter and the sleeve, and tighten it using a wrench.

5) Confirmation of adapter mounting screw

After installation of the magnetic flowmeter, be sure to retighten the adapter mounting screw according to Table 3.3.20 or Table 3.3.21. Be sure to confirm that leakage from adapter connection point does not occur by filling the pipe of the flowtube with fluid.

NOTE

The sleeve, nut, and gasket are not provided with the flowmeter, and must be provided by the user.

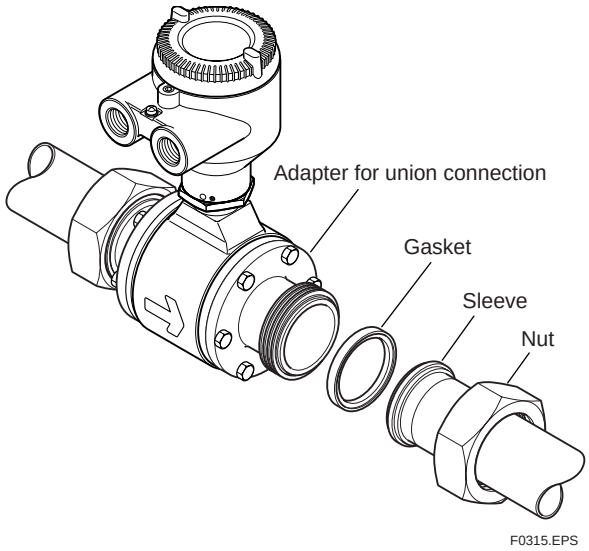


Figure 3.3.7 Mounting Procedure for Union Connection Style

(c) Butt weld adapter style

(process connection codes: KDB and KKB)

1) Removing adapter

Remove the butt weld adapter by loosening the mounting screws.

2) Welding ferrule or sleeve

Weld a ferrule, a sleeve, or an alternative (provided by the user) to the butt weld adapter.

IMPORTANT

- Be sure to weld the ferrule, the sleeve, or the alternative after removing the butt weld adapter from the flowmeter itself.
- When welding the ferrule, the sleeve, or the alternative, pay attention to the edge preparation, level differences between them and the piping, and the welding current to avoid deforming the piping or causing stagnation portion of the fluid.

3) Installing butt weld adapter

Install a gasket to fit in the groove of the butt weld adapter, and tighten the mounting screws.

⚠ CAUTION

- In case of standard gasket (EPDM rubber), tighten the adapter mounting screw according to the torque values in Table 3.3.20.
- In case that optional code GH (Silicon rubber) is selected, tighten the adapter mounting screw according to the torque values in Table 3.3.21.
- Tighten the adapter mounting screw in diagonal order step by step.
- After tightening of screw, confirm that gaskets protrude inside adapter. Protruding of gasket is necessary to keep the sanitary requirements.

Table 3.3.20 Tightening Torque Values of adapter for EPDM rubber gasket

Tightening torque values (N-m / {kgf-cm} / [in-lbf])	
Gasket type / Size mm (inch)	EPDM rubber (standard)
15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5)	3.0 to 3.5 / {30.59 to 35.69} / [26.55 to 30.98]
50 (2.0), 65 (2.5)	4.5 to 5.0 / {45.89 to 50.99} / [39.83 to 44.25]
80 (3.0)	8.0 to 9.0 / {81.58 to 91.78} / [70.81 to 79.65]
100 (4.0), 125 (5.0)	10 to 11 / {102.0 to 112.2} / [88.50 to 97.35]

T0502.EPS

Table 3.3.21 Tightening Torque Values of adapter for silicon rubber gasket

Tightening torque values (N-m / {kgf-cm} / [in-lbf])	
Gasket type / Size mm (inch)	Silicon rubber (optional code GH)
15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5)	2.0 to 2.5 / {20.39 to 25.49} / [17.70 to 22.13]
50 (2.0), 65 (2.5), 80 (3.0)	4.0 to 4.5 / {40.79 to 45.89} / [35.40 to 39.83]
100 (4.0), 125 (5.0)	6.0 to 6.5 / {61.18 to 66.28} / [53.10 to 57.53]

T0503.EPS

4) Mounting flowmeter to piping
Connect the flowmeter to the piping in a manner appropriate to the ferrule, the sleeve, or the alternative that has been welded to the adapter.

5) Confirmation of adapter mounting screw
After installation of the magnetic flowmeter, be sure to retighten the adapter mounting screw according to Table 3.3.20 or Table 3.3.21. Be sure to confirm that leakage from adapter connection point does not occur by filling the pipe of the flowtube with fluid.

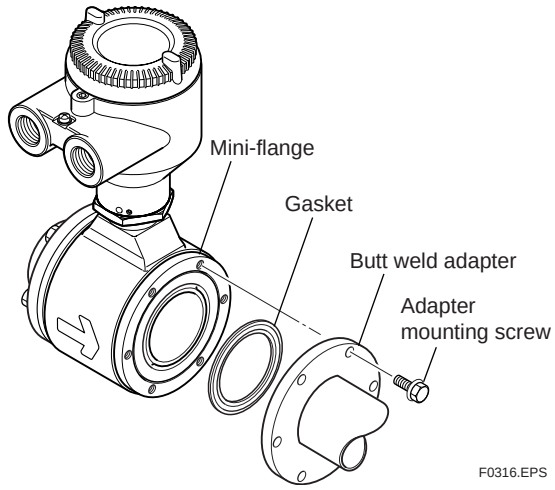


Figure 3.3.8 Mounting Procedure for Weld Joint Adapter Style

(3) Maintenance of Sanitary Type

Refer to Section 5.3

4. WIRING

4.1 Wiring the Integral Flowmeter

This section describes the wiring of the integral flowmeter.

WARNING

The wiring of the magnetic flowmeter must be performed by expert engineer or skilled personnel. No operator shall be permitted to perform procedures relating to wiring.

CAUTION

Once all wiring is complete, check the connections before applying power to the instrument. Improper arrangements or wiring may cause a unit malfunction or damage.

4.1.1 Wiring Precautions

Be sure to observe the following precautions when wiring:

CAUTION

- In cases where the ambient temperature exceeds 50 °C (122 °F), use external heat-resistant wiring with a maximum allowable temperature of 70 °C (158 °F) or above.
- Do not connect cables outdoors in wet weather in order to prevent damage from condensation and to protect the insulation, e.g. inside the terminal box of the flowmeter.
- All the cable ends must be provided with round crimp-on terminals and be securely wired.
- The signal cables may be routed in separate steel conduit tubes or flexible conduit tubes.
- If possible route the power and output signal cables in separate steel conduit tubes, except when the power supply voltage is 24 V and four-core cables are used for wiring. Keep conduits or flexible tubes watertight using sealing tape.
- When waterproof glands or union equipped waterproof glands are used, avoid tightening the glands with an excessive torque.
- In case of 24 V power supply version, it comes with a plug. Use this plug to cover the unused wiring port when wiring the instrument with only one, four-core cable.
- Be sure to turn the power off before opening the terminal box cover.
- Before turning the power on, tighten the terminal box cover securely.
- The terminal box cover is locked by the special screw. In case of opening the terminal box cover, use the hexagonal wrench attached. For handling the locking screw refer to fig. 4.1.5.
- Be sure to lock the cover by the special screw using the hexagonal wrench attached after installing the cover. For handling the locking screw refer to fig. 4.1.5.
- Hazardous duty type instruments must be wired in accordance with specific requirement (and, in certain countries, legal regulations) in order to preserve the effectiveness of their explosion protected features.

4.1.2 Power Cable/Output Cable

Use polyvinyl chloride insulated and sheathed control cables (JIS C 3401) or polyvinyl chloride insulated and sheathed portable power cables (JIS C 3312) or the equivalent.

Outer Diameter: 6.5 to 12 mm (0.26 to 0.47 in.),
10.5 mm or 11.5 mm (0.41 or 0.45 in.)
6.5 mm to 12 mm (0,24 to 0.47 in.)
Nominal Cross Section (Single wire): 0.5 to 2.5mm^2
Nominal Cross Section (Stranded wire):
0.5 to 1.5 mm^2

In case of power cable, Green/Yellow covered conductor shall be used only for connection to PROTECTIVE CONDUCTOR TERMINALS.
Conform to IEC227, IEC245 or equivalent national authorization.

IM 01R20D01-01E-E
3rd edition, Nov. 2006

NOTE

- For power cables, always use a crimp terminal with an insulation cover.
- Use crimp tools from the manufacturer of the crimp terminal you want to use to connect the crimp terminal and cable.
- Use crimp tools that are appropriate for the diameter of the cable to be connected.

4.1.3 Wiring Ports

This instrument is of watertight construction as stipulated in JIS C0920-1982. (Tests to prove protection against ingress of water and degrees of protection against ingress of solid objects for electrical equipment.)
In case of the explosion proof type, refer to Chapter 8.

(1) When there are no particular optional specifications

The wiring port is sealed with a cap (not water-proof) that must be removed before wiring. At this time, handle the wiring port in accordance with the JIS C0920-1982 mentioned above.

(2) Wiring using waterproof glands

IMPORTANT

To prevent water or condensation from entering the converter housing, waterproof glands are recommended. Do not over-tighten the glands or damage to the cables may result. Tightness of the gland can be checked by confirming that the cable is held firmly in place.

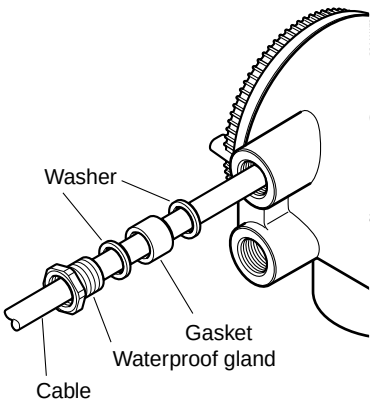


Figure 4.1.1 Waterproof Gland

For working on the electric wire tubes or the flexible tubes (PF1/2), use the waterproof gland and attach them directly to the wiring port.

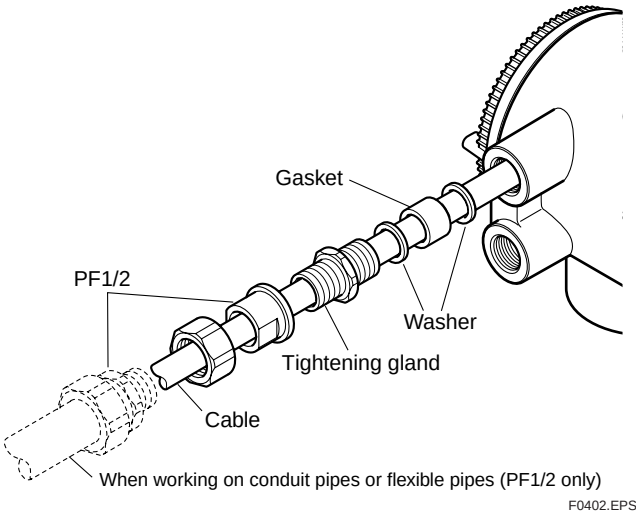


Figure 4.1.2 Waterproof Gland with Union Joint

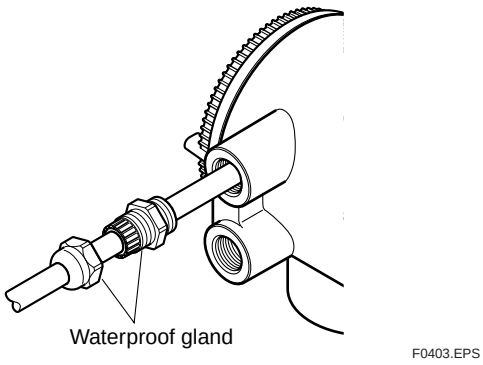
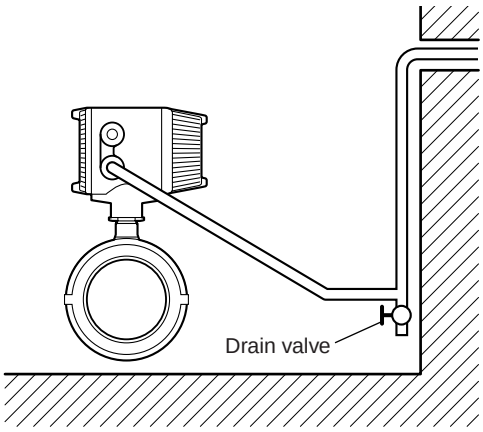


Figure 4.1.3 Plastic Gland

(3) Conduit Wiring

When wiring the conduits, pass the conduit through the wiring connection port, and utilize the waterproof gland to prevent water from flowing in. Place the conduit pipe on an angle as shown in Figure 4.1.4. Install a drain valve at the low end of the vertical pipe, and open the valve regularly.



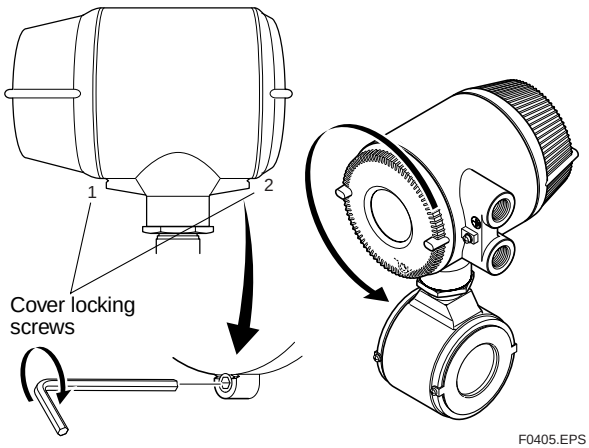
F0404.EPS

Figure 4.1.4 Conduit Wiring

4.1.4 Wiring Connections

(1) Removing Cover

Loosen cover locking screw 2 clockwise using a hexagonal wrench (nominal size 3 mm) to unlock the cover. (Upon shipment from the manufacturing plant, the cover is unlocked.) Hold the flowmeter with your hand and remove the cover by turning it in the direction of the arrow as shown below.

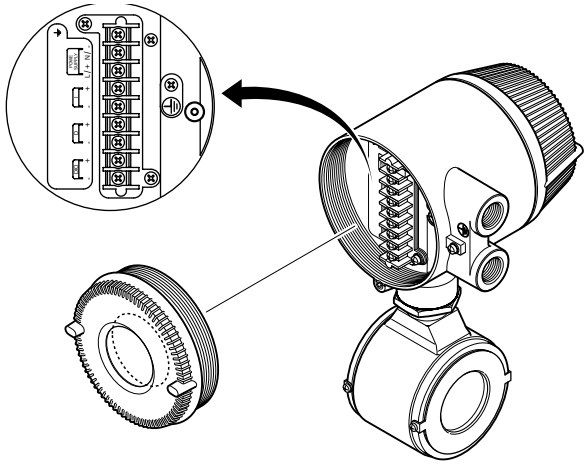


F0405.EPS

Figure 4.1.5 Removing the Terminal Box Cover

(2) Terminal Configuration

When the cover is removed, the connection terminals will be visible.



F0406.EPS

Figure 4.1.6 Terminal Configuration

The description of the terminal symbols is shown in Table 4.1.1.

For FOUNDATION Fieldbus protocol, please refer to IM 01E20F02-01E.

Table 4.1.1 Terminal Symbols

Terminal Symbols	Description
⏚	Functional grounding
N/- L/+	Power supply
I+ I-	Current output 4 to 20mA DC
DO+ DO-	Pulse output/Alarm output/ Status output
DIO+ DIO-	Alarm output/Status output Status input
⏚	Protective grounding (Outside of the terminal)

T0401.EPS

(3) Precautions for Wiring of Power Supply Cables

When connecting to the power supply, observe the points below. Failure to comply with these warnings may result in an electric shock or damage to the instrument.

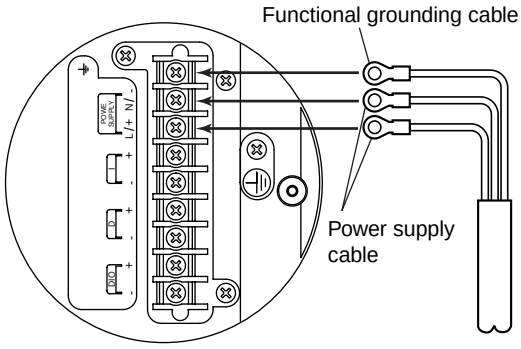
⚠ WARNING

- Ensure that the power supply is OFF in order to prevent electric shocks.
- Ensure the protective grounding terminal is grounded with a grounding resistance of 100 V or less before turning the power on.

- Use insulating sleeve crimp terminals (for 4-mm screws) for the power supply wiring and protective grounding wiring.
- Install an external switch or circuit breaker as a means to turn the powe off (capacitance; 15A, conforming to IEC947-1 and IEC947-3). Locate this switch either near the instrument or in other places facilitating easy operation. Affix a “Power Off Equipment” label to this external switch or circuit breaker.

Wiring Procedure

1. Turn the instrument's power off.
2. Wire the power supply cable and the functional grounding cable to the power supply terminals.



F0407.EPS

Figure 4.1.7 Electric Cable Wiring

(4) DC Power Connection

When using DC power as the power supply for the converter, give attention to the following points.

1) Connecting Power Supply

IMPORTANT

Do not connect power supply with reversed polarities.

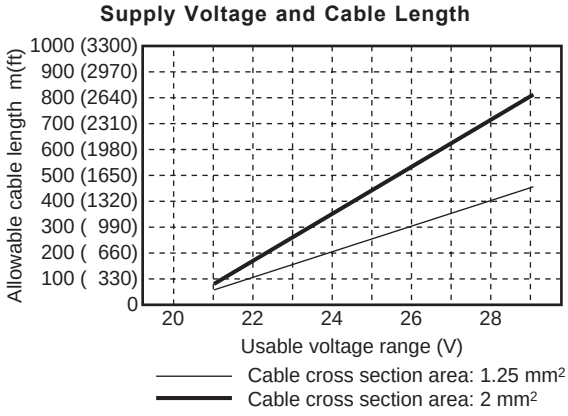
L/+ terminal: connect +

N/– terminal: connect –

2) Required Power Supply Voltages

IMPORTANT

When using a 24 V power supply, the specification for the supply voltage is 24 V (–15% to +20%), but the input voltage of the converter drops due to cable resistance therefore it must be used within the following ranges.



F0408.EPS

3) Setting Power Supply Frequency

IMPORTANT

Set the local power frequency in order to eliminate the effect of induction noise from the power supply.
Refer to “Chapter 6: Parameter Description” in the user’s manual of the AXF Integral Flowmeter [Software Edition] (IM 01R20C02-01E-E).
Parameter No.: **J30** and **J31**

(5) Grounding

CAUTION

Be sure to connect the protective grounding of the AXF integral flowmeter with a cable of 2mm^2 or larger cross section in order to avoid electrical shock to the operators and maintenance engineers and to prevent the influence of external noise.
Connect the grounding wire to the ⏚ mark.
The grounding should satisfy Class D requirements (ground resistance, 100 Ω or less).
For explosion proof type, follow the domestic electrical requirements as regulated in each country.

IMPORTANT

When a lightning protector (option code: /A) is selected, the ground should satisfy Class c requirements, use a grounding resistance of 10 Ω or less.

- The protective grounding terminals ⏚ are located on the inside and outside of the terminal area. Either terminal may be used.
- Use 600-V vinyl insulation wires as the grounding wires.

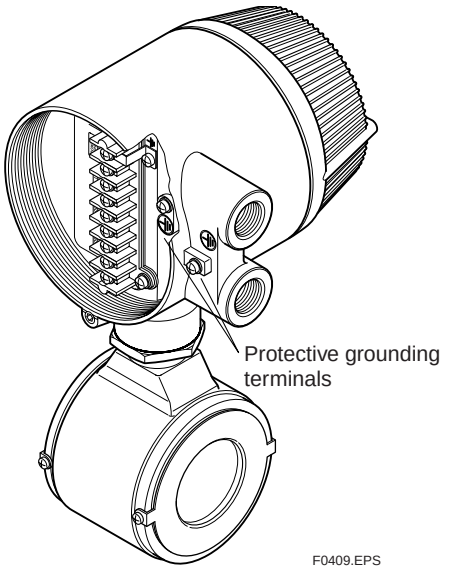


Figure 4.1.8 Protective Grounding Terminal Location

IMPORTANT

Improper grounding can have an adverse effect on the flow measurement. Ensure that the instrument is properly grounded.

The electromotive force of the magnetic flowmeter is minute and it is easily affected by noise, and the reference electric potential is the same as that of the measuring fluid. Therefore, the reference electric potential (terminal potential) of the flowtube and converter also need to be the same as that of the measuring fluid. Moreover, the potential must be the same as the ground. The magnetic flowmeter is equipped with an grounding ring that makes a connection with the charge of the measured fluid for grounding and protects the lining. Be sure to ground the flowmeter according to Figure 4.1.9.

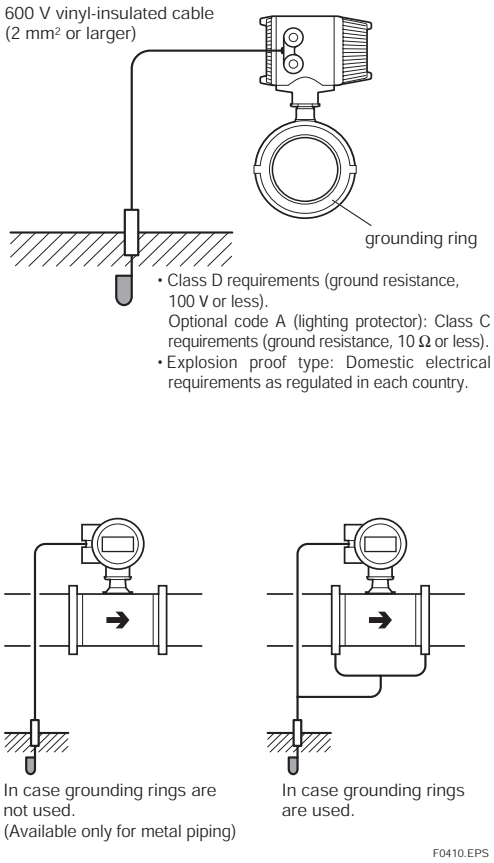

600 V vinyl-insulated cable
(2 mm² or larger)
grounding ring
• Class D requirements (ground resistance, 100 V or less).
Optional code A (lighting protector): Class C requirements (ground resistance, 10 Ω or less).
• Explosion proof type: Domestic electrical requirements as regulated in each country.
In case grounding rings are not used.
(Available only for metal piping)
In case grounding rings are used.
F0410.EPS

Figure 4.1.9 Grounding

(6) Connecting to External Instruments

WARNING

Before wiring with external instruments, be sure to turn off the magnetic flowmeter and any external instruments.

Connect the AXF integral flowmeter terminal to external instruments, giving attention to the following points.

For FOUNDATION Fieldbus protocol, please refer to IM 01E20F02-01E.

· 4-20 mA DC Output

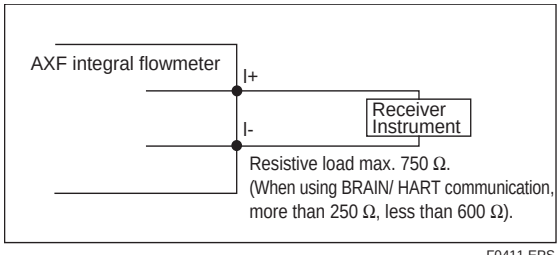


Figure 4.1.10 4-20 mA DC Output Connection

▪ Pulse Output

IMPORTANT

- As this is a transistor contact (isolated type), give attention to proper voltage and polarity when wiring.
- Do not apply a voltage larger than 30 V DC or a current larger than 0.2 A in order to prevent damage to the instrument.
- When input filter constant of the electronic counter is large in relation to the pulse width, the signal will decrease and the count will not be accurate.
- If the input impedance of the electronic counter is large, an induction noise from the power supply may result in inaccurate counts. Use a shielded cable or sufficiently reduce the input impedance of the electronic counter within the electromagnetic flowmeter pulse output specification range.
- The active pulse output (optional code /EM) cannot be used in conjunction with the standard pulse output.
- When the active pulse output (optional code /EM) is selected, do not short-circuit the DO+ and DO– terminals to avoid damaging the instrument.
- When the active pulse output (optional code /EM) is selected, the range of oulse rate must be set to 2 pps maximum.
- To avoid communication (BRAIN/ HART) failure, it is recommended to use the shield cable.

NOTE

For pulse output from the DO terminals, parameters must be set. Refer to “Parameter Description” in the user’s manual of the AXF Integral Flowmeter [Software Edition] (IM 01R20C02-01E-E).

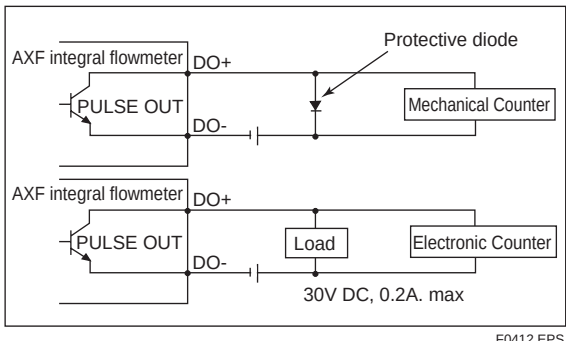


Figure 4.1.11 Pulse Output Connection

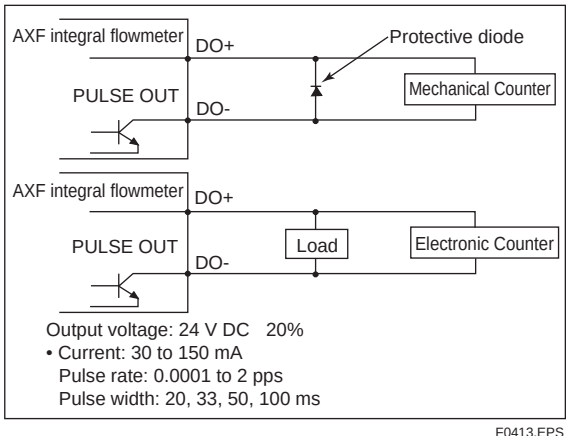


Figure 4.1.12 Active Pulse Output (/EM)

· **Status Input**

IMPORTANT

Status inputs are designed for use with no-voltage (dry) contacts. Be careful not to connect the status to any signal source carrying voltage. Applying voltage may damage the input circuit.

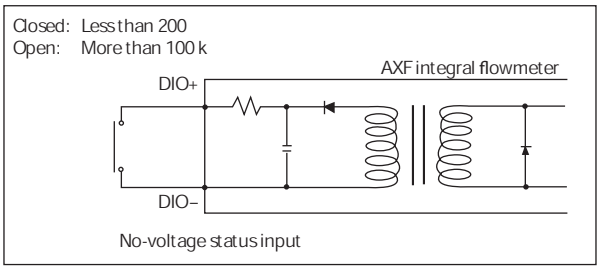


Figure 4.1.13 Status Input Connection

NOTE

For status input to the DIO terminals, parameters must be set. Refer to “Parameter Description” in the user’s manual of the AXF Integral Flowmeter [Software Edition] (IM 01R20C02-01E-E).

· **Status Output / Alarm Output**

IMPORTANT

Since this is an insulated transistor output, be careful of voltage and polarity when wiring. Do not apply a voltage larger than 30 V DC or a current larger than 0.2 A in order to prevent damage to the instrument.
This output cannot switch an AC load. To switch an AC load, an intermediate relay must be inserted as shown in Figure 4.1.14.
*The alarm output operates from open (normal) to closed (alarm occurrence) in the default value (as setup upon plant shipment). Changes can be made via the parameter settings.

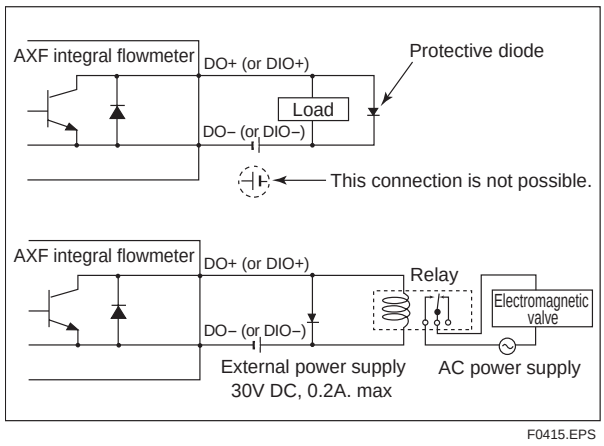


Figure 4.1.14 Status Output/Alarm Output Connection

NOTE

For status and alarm outputs from the DO or DIO terminals, parameters must be set. Refer to “Parameter Description” in the user’s manual of the AXF Integral Flowmeter [Software Edition] (IM 01R20C02-01E-E).

(7) Installing the Cover

Install the cover to the flowmeter by turning it in the direction of the arrow as shown below. Tighten cover locking screw 2 counterclockwise using a hexagonal wrench (nominal size 3 mm) to lock the cover.

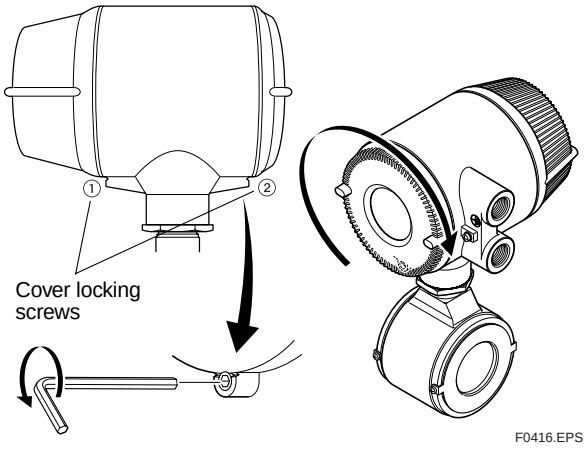


Figure 4.1.15 Installing the Terminal Box Cover

4.2 Wiring the Remote Flowtube

This section describes the wiring of the remote flowtube only. For information relating to the wiring of the converter, refer to the user's manual of the AXFA11 Magnetic Flowmeter Remote Converter (IM 01R20C01-01E-E) or the AXFA14 Magnetic Flowmeter Remote Converter (IM 01R20C02-01E-E).

WARNING

The wiring of the magnetic flowmeter must be performed by expert engineer or skilled personnel. No operator shall be permitted to perform procedures relating to wiring.

CAUTION

Once all wiring is complete, check the connections before applying power to the instrument. Improper arrangements or wiring may cause a unit malfunction or damage.

4.2.1 Wiring Precautions

Be sure to observe the following precautions when wiring:

CAUTION

- In cases where the ambient temperature exceeds 50 °C (122 °F), use external heat-resistant wiring with a maximum allowable temperature of 70 °C (158 °F) or above.
- Do not connect cables outdoors in wet weather in order to prevent damage from condensation and to protect the insulation, e.g. inside the terminal box of the flowtube.
- Do not splice the cable between the flowtube terminal and the converter if it is too short. Replace the short cable with a cable that is the appropriate length.
- All the cable ends must be provided with round crimp-on terminals and be securely wired.
- The signal cables may be routed in in separate steel conduit tubes or flexible conduit tubes.
- Keep conduits or flexible tubes watertight using sealing tape.
- Ground the remote flowtube and the converter separately (with grounding resistance of 100V or less)
- Cover each shield of the signal cable with vinyl tube or vinyl tape to avoid contact between two shields or between a shield and a case.
- When waterproof glands or union equipped waterproof glands are used, avoid tightening the glands with an excessive torque.
- Be sure to turn the power off before opening the terminal box cover.
- Before turning the power on, tighten the terminal box cover securely.
- The terminal box cover of size 2.5 mm to 400 mm is locked by the special screw. In case of opening the terminal box cover, use the hexagonal wrench attached. For handling the locking screw, refer to Figure 4.2.8.
- Be sure to lock the cover of size 2.5 mm to 400 mm by the special screw using the hexagonal wrench attached after installing the cover. For handling the locking screw, refer to Figure 4.2.15.
- Hazardous duty type instruments must be wired in accordance with specific requirement (and, in certain countries, legal regulations) in order to preserve the effectiveness of their explosion protected features.
- When submersible type or optional code DHC is selected, waterproof glands, signal and excitation cables are attached.
  In order to preserve the effectiveness of waterproof features, the terminal box cover and waterproof glands must not be detached from flowmeter.

4.2.2 Cables

(1) Dedicated Signal Cable (AXFC)

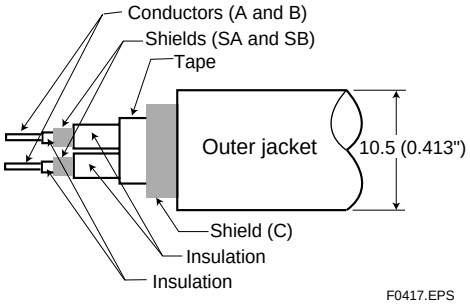


Figure 4.2.1 Dedicated Signal Cable AXFC

The flow signal is transmitted via this dedicated cable. The cable is constructed with double shielding over the two conductors, and heat-resistant vinyl is used for the outer jacket material.

Finished diameter: 10.5 mm (0.413")
Maximum length:
Combination with the AXFA11 converter: 200 m (660 ft)
Combination with the AXFA14 converter: 100 m (330 ft)
Maximum temperature: 80 °C (176 °F)

IMPORTANT

If the cable is longer than required, cut off any extra length rather than coiling it up, and terminate the conductors as shown in Figure 4.2.2. Avoid using junction terminal boards to extend the cable length, as this will interrupt the shielding.

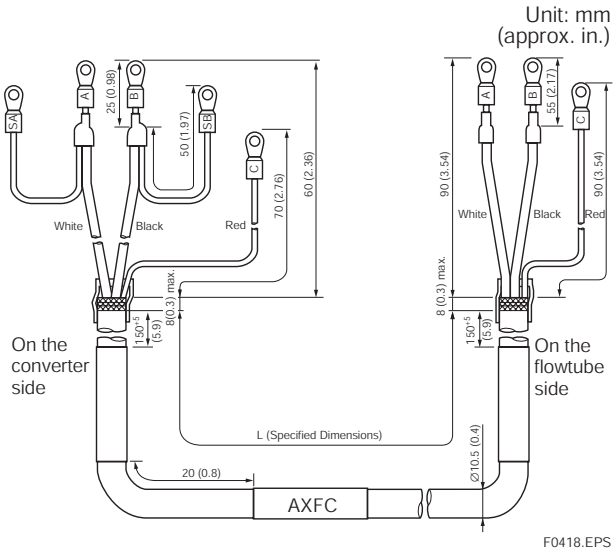


Figure 4.2.2 Treatment of Dedicated Signal Cables

CAUTION

- As crimp terminals A, B, SA, SB and C have their own electrical potentials, securely insulate them so as not to come in contact with one another.
- To prevent a shield from coming in contact with another shield or the case, cover each shield with a vinyl tube or wrap it in vinyl tape.

NOTE

Conductors A and B carry the signal from the electrodes, and C is at the potential of the liquid (signal common). Shields SA and SB are kept at the same potentials as the individual electrodes (these are actively driven shields.) This is done to reduce the effect of the distributed capacitance of the cable at long cable length. Note that, since the signals from the individual electrodes are impedance converted inside the converter, errors will result if they come in contact with any other component. Great care must be taken in the cable end treatment.

(2) Excitation Cable

Use polyvinyl chloride insulated and sheathed control cables (JIS C 3401) or polyvinyl chloride insulated and sheathed portable power cables (JIS C 3312) or the equivalent.

Outer Diameter: 6.5 mm to 12 mm (0.26 to 0.47 in),
Nominal Cross Section (Single wire): 0.5 to 2.5mm^2
Nominal Cross Section (Stranded wire): 0.5 to 1.5 mm^2

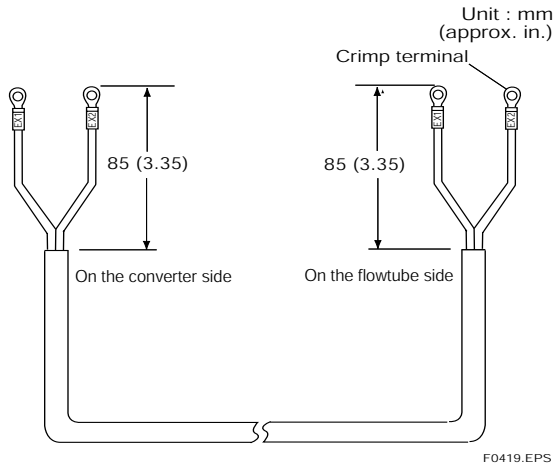


Figure 4.2.3 End Treatment of Excitation Cable

NOTE

- For excitation cables, always use a crimp terminal with an insulation cover.
- Use crimp tools from the manufacturer of the crimp terminal you want to use to connect the crimp terminal and cable.
- Use crimp tools that are appropriate for the diameter of the cable to be connected.

4.2.3 Wiring Ports

This instrument is of watertight construction as described in JIS C0920-1982. (Tests to prove protection against ingress of water and degrees of protection against ingress of solid objects for electrical equipment.) It is shipped with a wiring bracket (waterproof gland or waterproof gland with union) or a plastic gland attached, only in cases where an optional specification is selected for the wiring port. In case of hazardous duty type refer to chapter 8.

(1) When there are no particular optional specifications

The wiring port is sealed with a cap (not waterproof) that must be removed before wiring. At this time, handle the wiring port in accordance with the JIS C0920-1982 mentioned above.

(2) Wiring using waterproof glands

IMPORTANT

To prevent water or condensation from entering the converter housing, waterproof glands are recommended. Do not over-tighten the glands or damage to the cables may result. Tightness of the gland can be checked by confirming that the cable is held firmly in place.

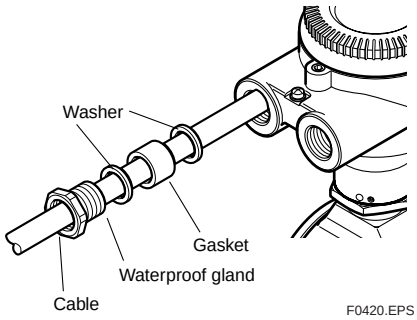


Figure 4.2.4 Waterproof Gland

For working on the electric wire tubes or the flexible tubes (PF1/2), remove the waterproof gland and attach them directly to the wiring port.

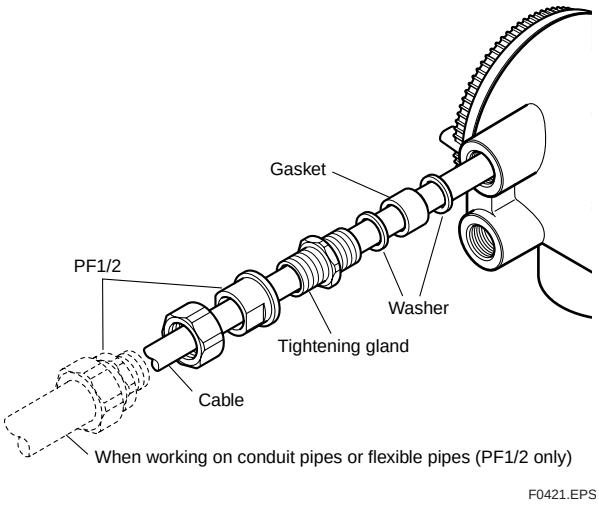
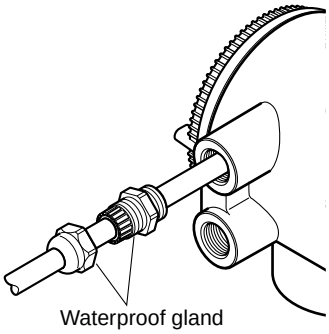


Figure 4.2.5 Waterproof Gland with Union Joint

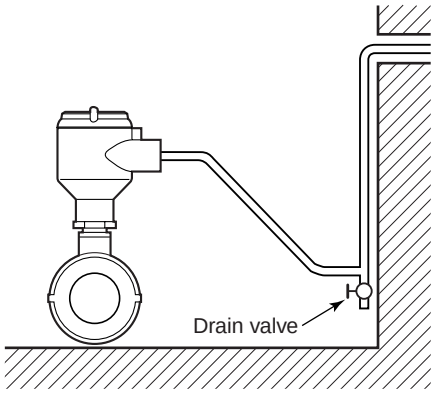


F0422.EPS

Figure 4.2.6 Plastic Gland

(3) Conduit Wiring

When wiring the conduits, pass the conduit through the wiring connection port, and utilize the waterproof gland to prevent water from flowing in. Place the conduit pipe on an angle as shown in Figure 4.2.7. Install a drain valve at the low end of the vertical pipe, and open the valve regularly.



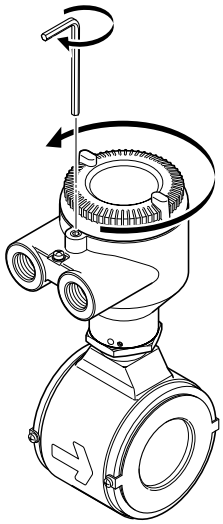
F0423.EPS

Figure 4.2.7 Conduit Wiring

4.2.4 Wiring Connections

(1) Removing Cover

Loosen the cover locking screw clockwise using a hexagonal wrench (nominal size 3 mm) to unlock the cover. (Upon shipment from the manufacturing plant, the cover is unlocked.) Hold the flowtube with your hand and remove the cover by turning it in the direction of the arrow as shown below.



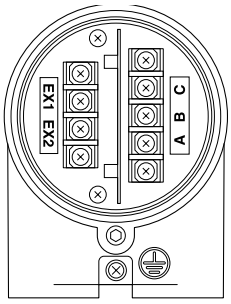
F0424.EPS

Figure 4.2.8 Removing the Terminal Box Cover (Remote Flowtube)

(2) Terminal Configuration

When the cover is removed, the connection terminals will be visible.

General style :

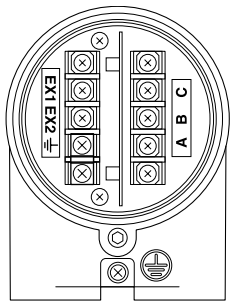


Terminal Symbols	Description
A B C	Flow signal output
EX1 EX2	Excitation current input
⏚	Protective grounding (Outside of the terminal)

F0425.EPS

Figure 4.2.9 Terminal Configuration (General-Purpose Use, Submersible Style, Sanitary Style, Size 2.5 to 400 mm (0.1 to 16 in.))

:



Terminal Symbols	Description
A B C	Flow signal output
EX1 EX2	Excitation current input
⏚	Functional grounding (Only for explosion proof type)
⏚	Protective grounding (Oitside of the terminal)

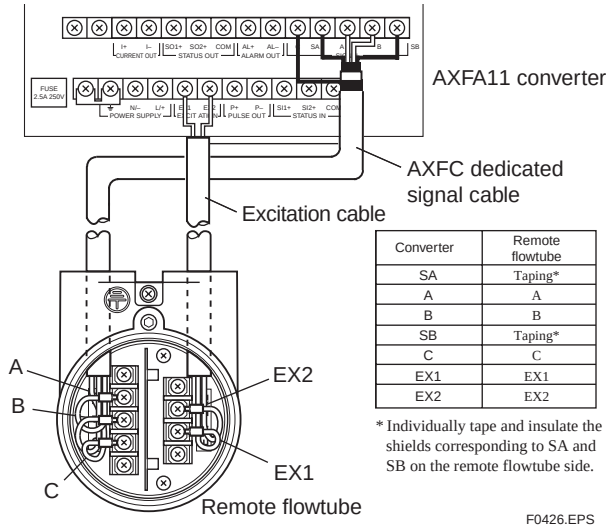
F042401.EPS

Figure 4.2.10 Terminal Configuration (Explosion proof Type, Size 2.5 to 400 mm (0.1 to 16 in.))

3) Wiring the Remote Flowtube (General Purpose Use, Submersible Style) with Converters

1) Connection with the AXFA11 converter

Connect wiring as shown in the figure below.



Converter	Remote flowtube
SA	Taping*
A	A
B	B
SB	Taping*
C	C
EX1	EX1
EX2	EX2

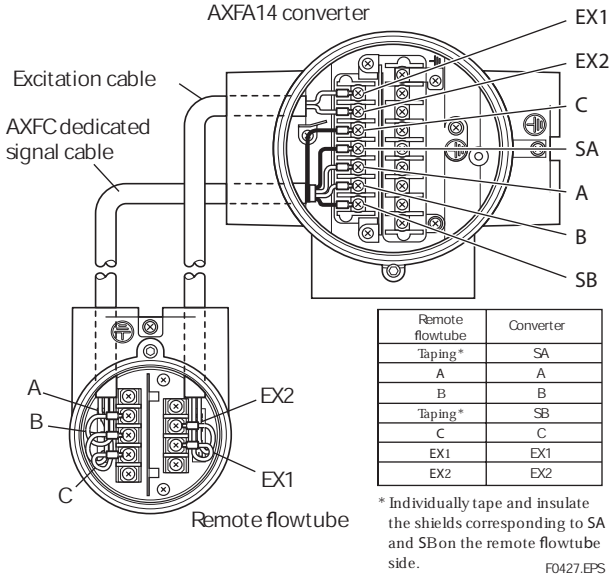
* Individually tape and insulate the shields corresponding to SA and SB on the remote flowtube side.

F0426.EPS

Figure 4.2.10 Wiring Diagram

2) Connection with the AXFA14 converter

Connect wiring as shown in the figure below.



Remote flowtube	Converter
Taping*	SA
A	A
B	B
Taping*	SB
C	C
EX1	EX1
EX2	EX2

* Individually tape and insulate the shields corresponding to SA and SB on the remote flowtube side.

F0427.EPS

Figure 4.2.11 Wiring Diagram

⚠ CAUTION

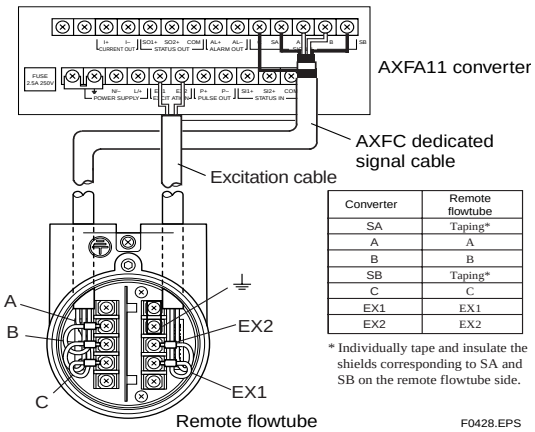
Before wiring, be sure that the AXFA11 or AXFA14 converter has been turned off to prevent an electrical shock.

(4) Wiring the Remote Flowtube (Explosion Proof Type) with Converters

1) Connection with the AXFA11 converter

In case of the explosion proof type for ATEX, FM, CSA and IECEx certification connect wiring as shown in the figure below.

In case of the explosion proof type the protective grounding ⏚ of remote flowtube must be connected to a suitable IS grounding system. In that case, ⏚ (functional grounding terminal) need not be connected.



Converter	Remote flowtube
SA	Taping*
A	A
B	B
SB	Taping*
C	C
EX1	EX1
EX2	EX2

* Individually tape and insulate the shields corresponding to SA and SB on the remote flowtube side.

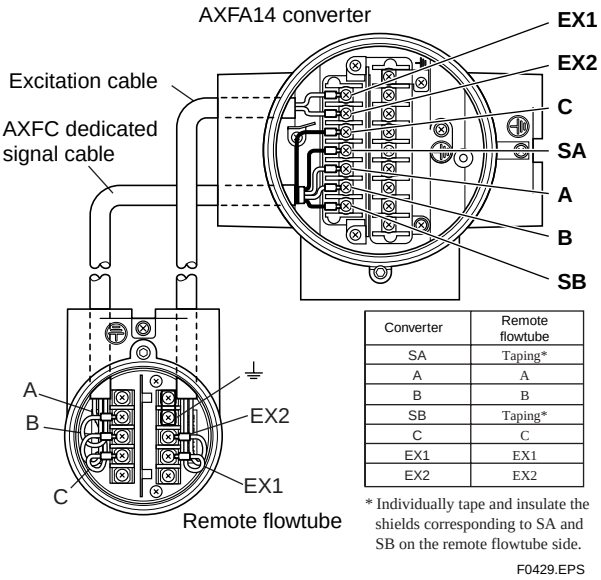
F0428.EPS

Figure 4.2.12 Wiring Diagram

2) Connection with the AXFA14 converter

In case of the explosion proof type for ATEX, FM, CSA and IECEx certification connect wiring as shown in the figure below.

In case of the explosion proof type, the protective grounding ⏚ of remote flowtube must be connected to a suitable IS grounding system. In that case, ⏚ (functional grounding terminal) need not be connected.



Converter	Remote flowtube
SA	Taping*
A	A
B	B
SB	Taping*
C	C
EX1	EX1
EX2	EX2

* Individually tape and insulate the shields corresponding to SA and SB on the remote flowtube side.

F0429.EPS

Figure 4.2.13 Wiring Diagram

⚠ CAUTION

Before wiring, be sure that the AXFA11 or AXFA14 converter has been turned off to prevent an electrical shock.

(5) Grounding

⚠ CAUTION

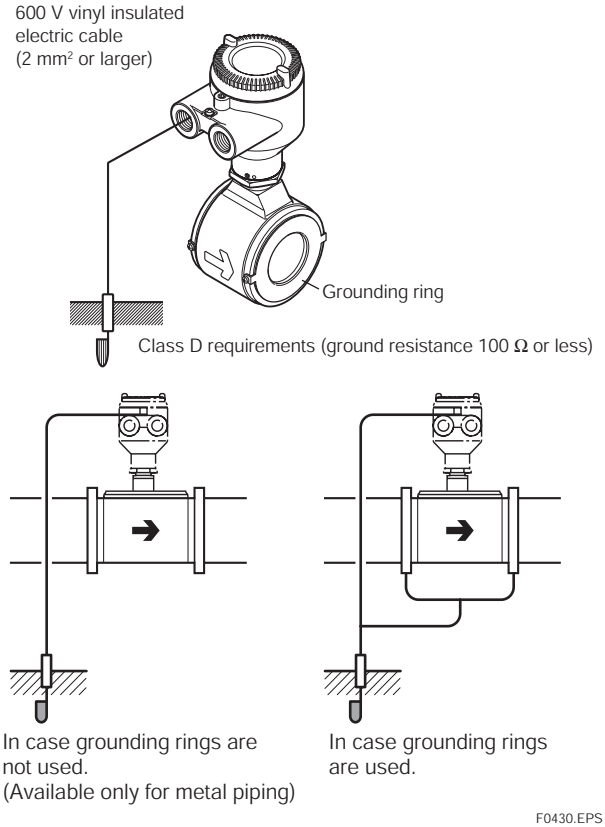
Be sure to connect the protective grounding of the AXF remote flowtube with a cable of 2mm^2 or larger cross section in order to avoid electrical shock to the operators and maintenance engineers and to prevent the influence of external noise.
Connect the grounding wire to the ⏚ mark.
The grounding should satisfy Class D requirements (ground resistance, 100 Ω or less).
For explosion proof type, follow the domestic electrical requirements as regulated in each country.

IMPORTANT

Improper grounding can have an adverse affect on the flow measurement. Ensure that the instrument is properly grounded.

The electromotive force of the magnetic flowmeter is minute and it is easy to be affected by noise. And also that reference electric potential is the same as the measuring fluid potential. Therefore, the reference electric potential (terminal potential) of the flowtube and the converter also need to be the same as the measuring fluid. Moreover, that the potential must be the same with ground. The magnetic flowmeter is equipped with an grounding ring that makes a connection with the charge of the measured fluid for grounding and protects the lining.

Be sure to ground according to Figure 4.2.14.

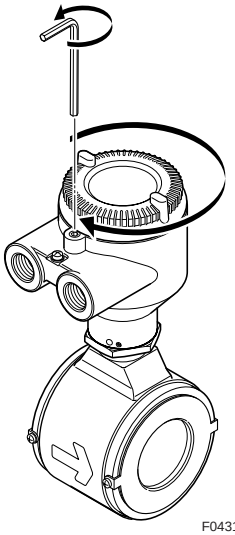

600 V vinyl insulated electric cable (2 mm² or larger)
Grounding ring
Class D requirements (ground resistance 100 Ω or less)
In case grounding rings are not used.
(Available only for metal piping)
In case grounding rings are used.

F0430.EPS

Figure 4.2.14 Protective Grounding Terminal Location

(6) Installing the Cover (Size 2.5 to 400 mm (0.1 to 16 in.)

Install the cover to the flowtube by turning it in the direction of the arrow as shown below. Tighten the cover locking screw counterclockwise using a hexagonal wrench (nominal size 3 mm) to lock the cover.



F0431.EPS

Figure 4.2.15 Installing the Terminal Box Cover (Remote Flowtube)

5. MAINTENANCE

WARNING

- Maintenance work must be carried out by expert engineer or skilled personnel and not by operators.
- Before opening the cover, it is important to ensure that at least 10 minutes have passed since the power was turned off. Furthermore, opening of the cover must also be carried out by expert engineer or skilled personnel.

CAUTION

- Hazardous duty types must be, as a rule, removed to a non-hazardous area for maintenance and be disassembled and reassembled to the original state.
- The terminal box cover is locked by the special screw. In case of opening the terminal box cover, use the hexagonal wrench attached.
- Be sur to lock the cover by the special screw using the hexagonal wrench attached after installing the cover.

5.1 Changing Direction of Electrical Connection

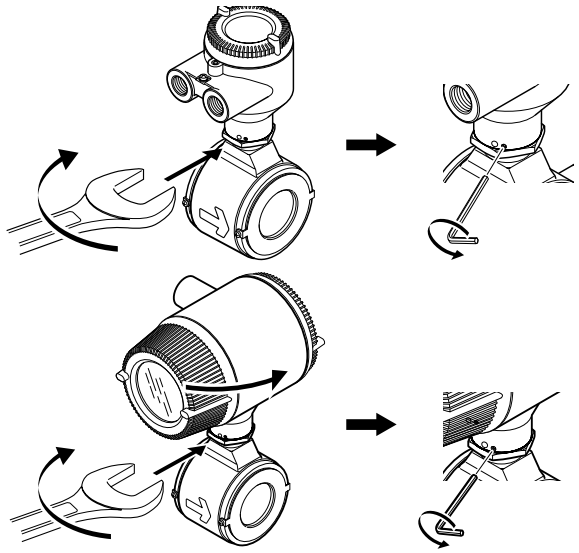
IMPORTANT

The following types can not be changed direction of electrical connection after delivery.
- Submersible Type.
- Optional code DHC (for district heating and cooling or condensation-proof).

(1) The following tools are required to change the direction of theparts for the electrical connection:
- Hexagonal wrench (nominal size 1.5): Comes with the instrument.
- Wrench (size 40mm)

(2) Turn off the power to the flowmeter.

(3) Using the wrench, loosen the hexagonal nut at the neck of the instrument.



F0501.EPS

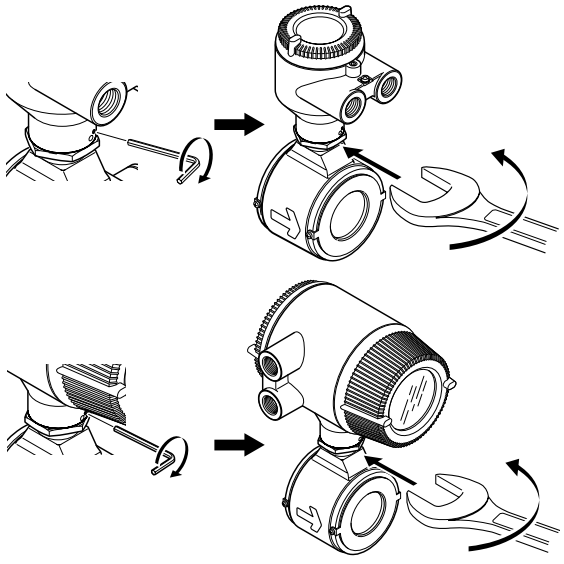
(4) Using the hexagonal wrench, loosen the screw in the neck.

(5) Turn the converter or the terminal box in the desired direction.

NOTE

The converter and the terminal box can be turned –140° to +180° from the arrow mark indicating the flow direction. Do not exceed these angle.

(6) Using the hexagonal wrench, retighten the neck screw.



F0502.EPS

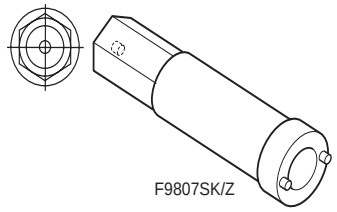
(7) Using the wrench, retighten the hexagonal nut at the neck. After that, check that the converter or terminal box is fixed.

5.2 Removing, Cleaning, and Installing Replaceable Electrodes (General Purpose Use Type Only)

5.2.1 Removing Replaceable Electrodes

(1) The following tools are required to replace the electrodes:

- Special tool for removing and installing electrodes (F9807SK/Z Z= KEM 00667-01): Optional
- Torque wrench or torque driver (nom.size 12mm)
- Phillips screwdriver



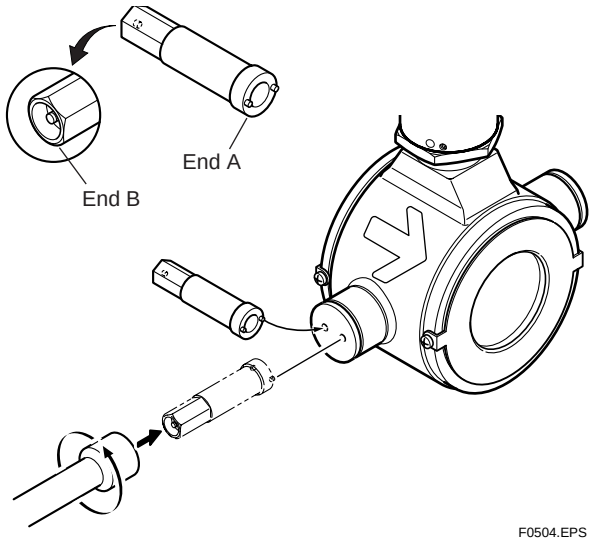
(2) Turn off the power to the flowmeter.

(3) Drain the fluid from the interior of the flowtube.

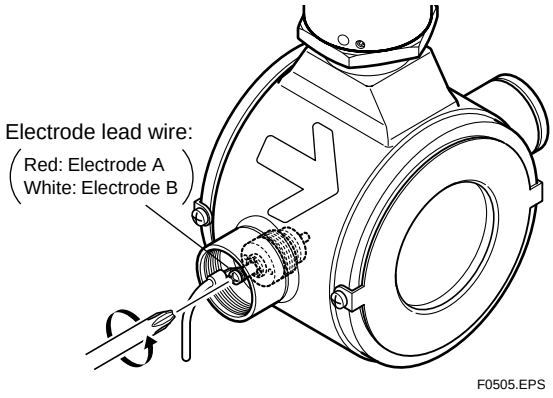
WARNING

- Never fail to drain the fluid from the interior of the flowtube.
- If the fluid is at a high temperature, the instrument itself may also be hot. Be careful not to get burned when removing the electrodes.
- When the process fluid is hazardous to humans, exercise caution to avoid coming into contact with it, and avoid inhaling any residual gas.

(4) Using end A of the tool, open the electrode cover.



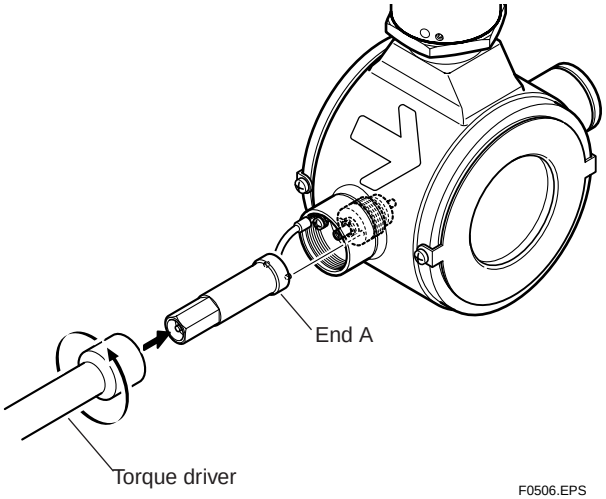
(5) Hold down the electrode lead wire and terminal lug and remove the mounting screw using the Phillips screwdriver.



NOTE

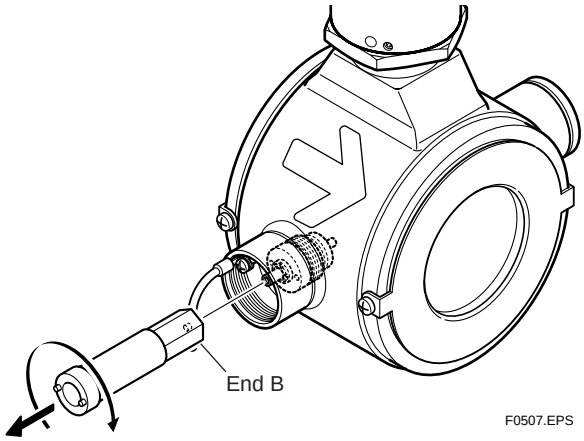
Always hold down the lead wire and terminal lug when removing the mounting screw.

(6) Move aside the electrode lead wire and avoiding the screw, insert end A of the tool to the electrode and loosen the electrode holder using the torque driver.



F0506.EPS

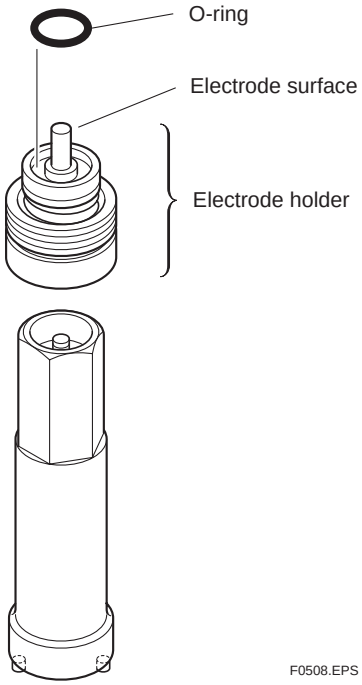
(7) Screw end B of the tool into the screw block of the electrode, and pull the tool straight out to remove the electrode holder.



F0507.EPS

5.2.2 Cleaning Replaceable Electrodes

(1) Clean the electrode surface (wetted part) with alcohol or other cleaning agents.

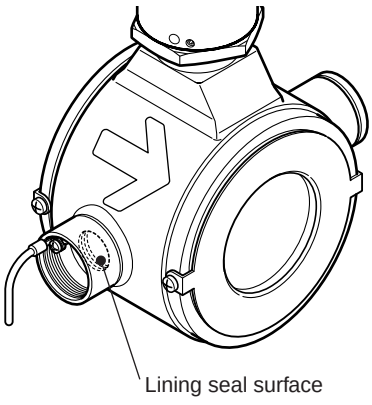


F0508.EPS

NOTE

The screw threads are coated with an anti-seizing compound. Avoid contact between the compound and the electrode.

(2) Clean the surface of the lining seal with an alcohol moistened swab.



F0509.EPS

5.2.3 Installing Replaceable Electrodes

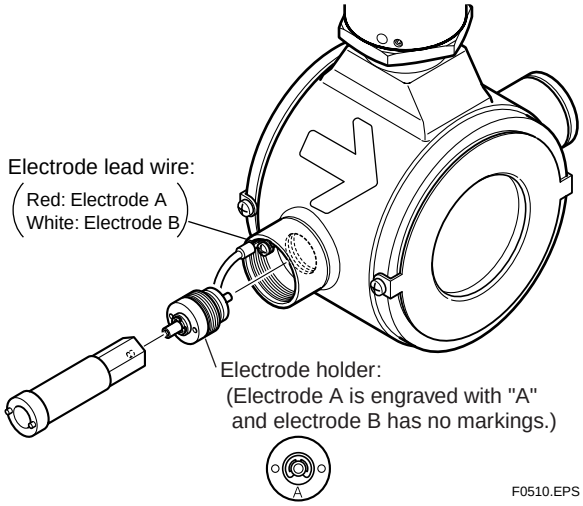
NOTE

It is recommended to replace the O-ring when reinstalling the replaceable electrode. Use the O-ring specified by Yokogawa (G9303SE: material is fluororubber).

NOTE

Precautions for storage of O-rings:
- Keep them in a cool, dark place.
- Wrap them well.
- Do not use O-rings after one year since their purchase.

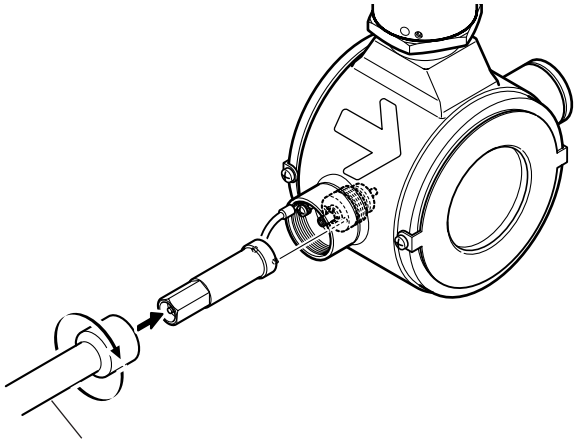
(1) Push the electrode holder with end B of the tool screwed into it, straight into the flowtube.



F0510.EPS

- Check that the O-ring is placed in its seat.
- Do not interchange electrodes A and B when installing them. Install electrode A to the electrode boss with the red lead wire and electrode B to the one with the white lead wire.

(2) Using end A of the tool, tighten the electrode holder.



F0511.EPS

NOTE

Using the torque wrench or torque driver, tighten the electrode holder to the following torque values:

PFA lining:
8.0 N·m ±1 N·m (80 kgf·cm ±10 kgf·cm)

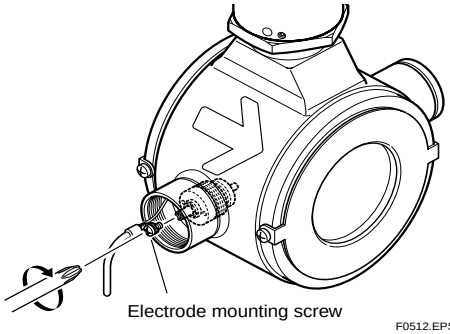
Polyurethane rubber lining:
3.0 N·m ±0.5 N·m (30 kgf·cm ±5 kgf·cm)

WARNING

If the electrode holder was not tightened to its specified torque value, fluid leakage from the electrode may result. Should fluid spill over the electrode block, wipe it dry and check that the O-ring is placed in its seat..

(3) Fill the interior of the flowtube with the fluid and check that there is no leakage from the electrode.

(4) Hold down the lead wire and the terminal lug and screw the mounting screw into the electrode using the Phillips screwdriver.

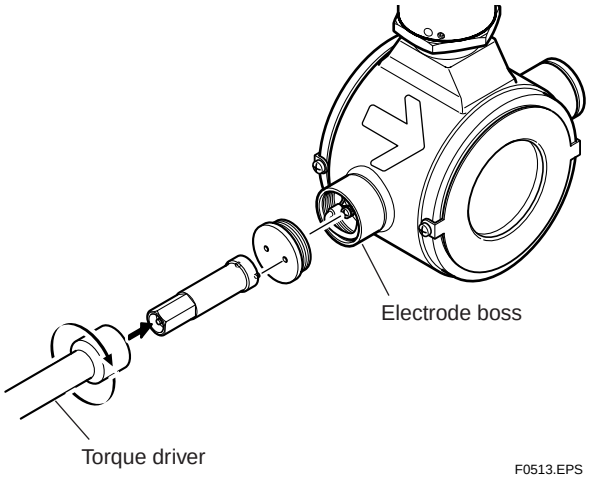


F0512.EPS

NOTE

Always hold down the lead wire and terminal lug when adjusting the mounting screw.

(5) Put the lead wire in the electrode boss, and install the electrode cover to the boss and tighten it using end A of the tool.



(6) Turn on the power to the flowmeter and start normal operation.

5.3 Removing and Installing Adapters for Sanitary Style

CAUTION

- This section describes how to remove and install a butt weld adapter as an example. Apply the same procedure to clamp and union adapters.
- Turn off the power of the magnetic flowmeter, and confirm that there is no fluid inside the pipe before removing the instrument from the pipe line.
- When installation, refer to section 3.3.6.

1) Removing the butt weld adapter

Remove the butt weld adapter by loosening the mounting screws.

2) Installing the butt weld adapter

Install a gasket to fit in the groove of the butt weld adapter, and tighten in the adapter with the mounting screws.

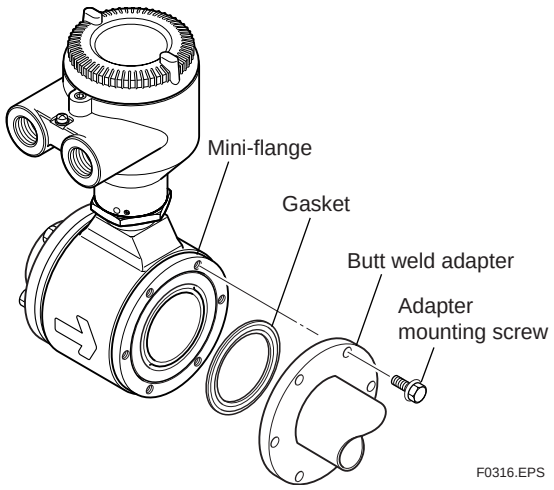


Figure 5.3.1 Removing and Installing a Butt Weld Adapter

CAUTION

- In case of standard gasket (EPDM rubber), tighten the adapter mounting screw according to the torque values in Table 5.3.1.
- In case that optional code /GH (Silicon rubber) is selected, tighten the adapter mounting screw according to the torque values in Table 5.3.2.
- Tighten the adapter mounting screw in diagonal order step by step.
- After tightening of screw, confirm that gaskets protrude inside adapter. Protruding of gasket is necessary to keep the sanitary requirements.

able 5.3.1 Tightening Torque Values of adapter for EPDM rubber gasket

Tightening torque values (N-m / {kgf-cm} / [in-lbf])	
Gasket type / Size mm (in.)	EPDM rubber (standard)
15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5)	3.0 to 3.5 / {30.59 to 35.69} / [26.55 to 30.98]
50 (2.0), 65 (2.5)	4.5 to 5.0 / {45.89 to 50.99} / [39.83 to 44.25]
80 (3.0)	8.0 to 9.0 / {81.58 to 91.78} / [70.81 to 79.65]
100 (4.0), 125 (5.0)	10 to 11 / {102.0 to 112.2} / [88.50 to 97.35]

T0502.EPS

Table 5.3.2 Tightening Torque Values of adapter for silicon rubber gasket

Tightening torque values (N-m / {kgf-cm} / [in-lbf])	
Gasket type / Size mm (in.)	Silicon rubber (optional code GH)
15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5)	2.0 to 2.5 / {20.39 to 25.49} / [17.70 to 22.13]
50 (2.0), 65 (2.5), 80 (3.0)	4.0 to 4.5 / {40.79 to 45.89} / [35.40 to 39.83]
100 (4.0), 125 (5.0)	6.0 to 6.5 / {61.18 to 66.28} / [53.10 to 57.53]

T0503.EPS

CAUTION

- The lining of sanitary style uses fluorocarbon PFA. For the property of fluorocarbon PFA, it is possible that the adapter mounting screws may loosen as time passes, so retighten them regularly.
- Be sure to retighten the adapter mounting screws according to the prescribed torque values in Table 5.3.1 or Table 5.3.2. Retighten them diagonally with the same torque values, step by step up to the prescribed torque value.
- In case of leakage from adapter connection point, retighten the adapter mounting screws. If leakage doesn't stop even if they are retightened, replace the gasket between mini-flange of flowmeter and adapter.
- It is recommended to replace the gasket periodically.
- It is necessary to decide the period between changes with consideration for the frequency of cleaning cycles, the cleaning temperature and the fluid temperature.
- Use the gasket specified by Yokogawa in Table 5.3.3

Table 5.3.3 Parts number of gasket

Gasket type / Size mm (in.)	EPDM rubber (standard)	Silicon rubber (optional code GH)
15 (0.5)	F9811QA	F9811QB
25 (1.0)	B1002EG	B1010EG
32 (1.25)	B1003EG	B1011EG
40 (1.5)	B1004EG	B1012EG
50 (2.0)	B1005EG	B1013EG
65 (2.5)	B1006EG	B1014EG
80 (3.0)	B1007EG	B1015EG
100 (4.0)	B1008EG	B1016EG
125 (5.0)	F9811QC	F9811QD

T0504.EPS

5.4 Components Replacement (Integral Flowmeter Only)

WARNING

- Component replacement and the associated operations must be carried out by expert engineer or skilled personnel and not by operators.
- Before opening the cover, it is important to ensure that at least 10 minutes have passed since the power was turned off. Furthermore, opening of the cover must also be carried out by expert engineer or skilled personnel.

IMPORTANT

- As a rule, maintenance of this flowmeter should be implemented in a maintenance service shop where the necessary tools are provided.
- The amplifier assembly contains sensitive parts that may be damaged by static electricity. Take care so as not to directly touch the electronic parts or circuit patterns on the board, for example, by preventing static electrification by using grounded wrist straps when handling the assembly. Also take precautions such as placing a removed amplifier assembly into a bag with an antistatic coating.

5.4.1 Fuse Replacement

CAUTION

Be sure to turn off the power before performing fuse replacement. Also be sure to use the spare fuse that was supplied with the product, or ones supplied by Yokogawa's sales or service offices.
Fuse type : T 2.5A, 250V, T, time-lag fuse

The fuse holder is located on the farthest circuit board from the front.

(1) Remove the amplifier assembly by following the procedures shown in Section 5.4.3 "Amplifier Replacement."

(2) The fuse can be seen after step (1). Remove the fuse from the fuse holder.

(3) Push a new fuse into the holder until it clicks.

(4) Reinstall the amplifier assembly by following the procedures shown in Section 5.4.3.

Spare fuses are shipped with the instrument.

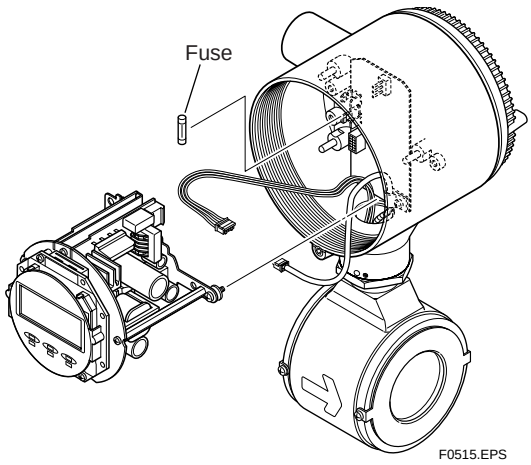


Figure 5.4.1 Fuse Replacement

5.4.2 Display Unit Replacement

5.4.2.1 Removing the Display Unit

(1) Turn off the power.

(2) Loosen cover locking screw 1 clockwise using a hexagonal wrench (nominal size 3) to unlock the cover. (Upon shipment from the manufacturing plant, the cover is locked.) Hold the flowmeter with your hand and remove the cover by turning it in the direction of the arrow as shown below.

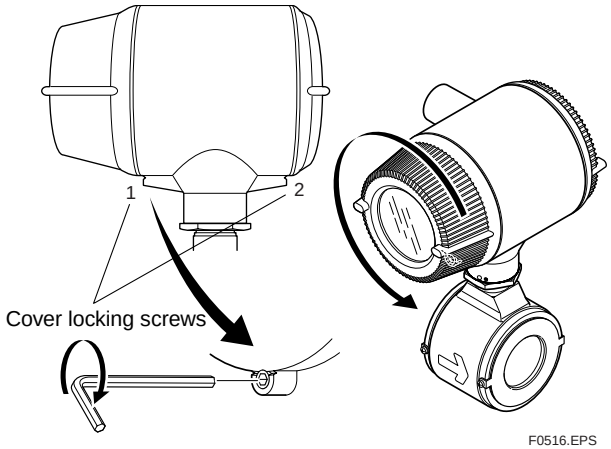


Figure 5.4.2 Removing the Display Cover

(3) Hold the display unit with your hand and remove the two mounting screws. Remove the connector of the display unit by pulling it to the left, taking care not to damage it (refer to Figure 5.4.3).

5.4.2.2 Assembling the Display Unit

(1) Reconnect the keyed display connector according to figure 5.4.3.

(2) Secure the display unit using its two mounting screws.

(3) Replace the cover by following the procedures used to remove it in the reverse order.

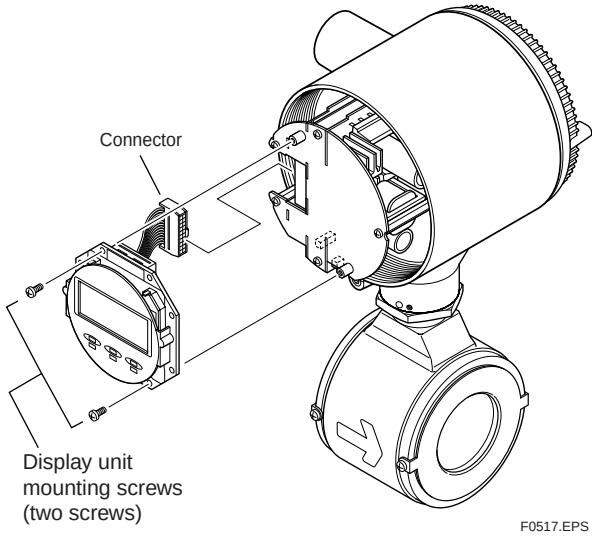


Figure 5.4.3 Removing and Assembling the Display Unit

5.4.2.3 Changing the Display Unit Orientation 90°

(1) Hold the display unit with your hand and remove the two mounting screws.

(2) Turn the display unit 90° clockwise and confirm the assembling position, taking care of the connector and wire of the display unit.

(3) Secure the display unit using its two mounting screws.

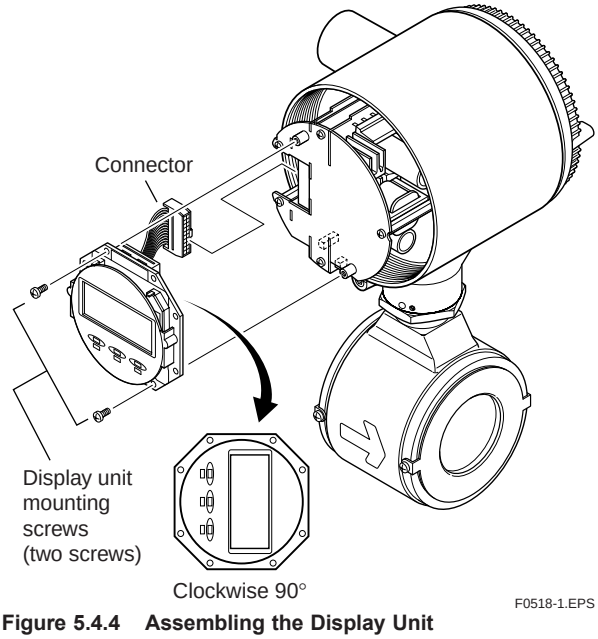


Figure 5.4.4 Assembling the Display Unit

5.4.2.4 Installing the Cover

(1) Install the cover to the flowmeter by turning it in the direction of the arrow as shown below. Tighten cover locking screw 1 counterclockwise using a hexagonal wrench (nominal size 3) to lock the cover.

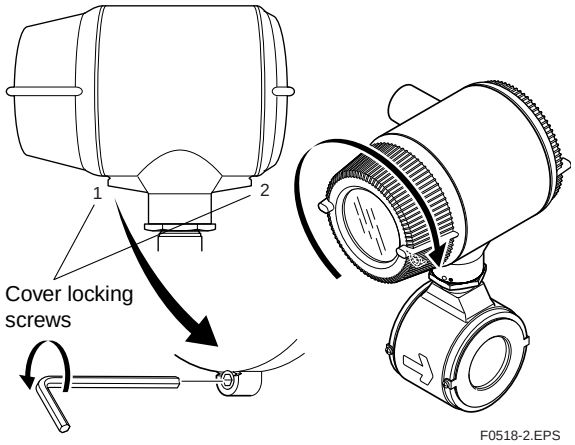


Figure 5.4.5 Installing the Display Cover

5.4.3 Amplifier Replacement

For FOUNDATION Fieldbus protocol, please refer to IM 01E20F02-01E.

IMPORTANT

In case of amplifier replacement, it is necessary to perform the parameter resetting.
For parameters, refer to Chapter 6: Parameter Description of IM 01R20C02-001E.

5.4.3.1 Removing the Amplifier Assembly

(1) Turn off the power.

(2) Remove the cover.

(3) Remove wiring connectors 1 and 2 (refer to Figure 5.4.6) from the amplifier assembly. Remove them carefully, without applying excessive force.

(4) Loosen the three mounting screws while holding the assembly with your hand.

(5) Pull the assembly straight out.

5.4.3.2 Assembling the Amplifier Assembly

(1) To replace the amplifier assembly, follow the procedures used to remove it in the reverse order.

(2) Replace the assembly by pushing it in, taking care not to damage the amplifier mounting connectors on the circuit board.

(3) Carefully connect wiring connectors 1 and 2 to the amplifier assembly, making sure that the connectors' directions are correct. Let wiring connector 2 pass along the amplifier side of the rod.

(4) Tighten the three mounting screws while holding the assembly with your hand.

(5) Replace the cover, taking care not to entangle the cables of the wiring connectors.

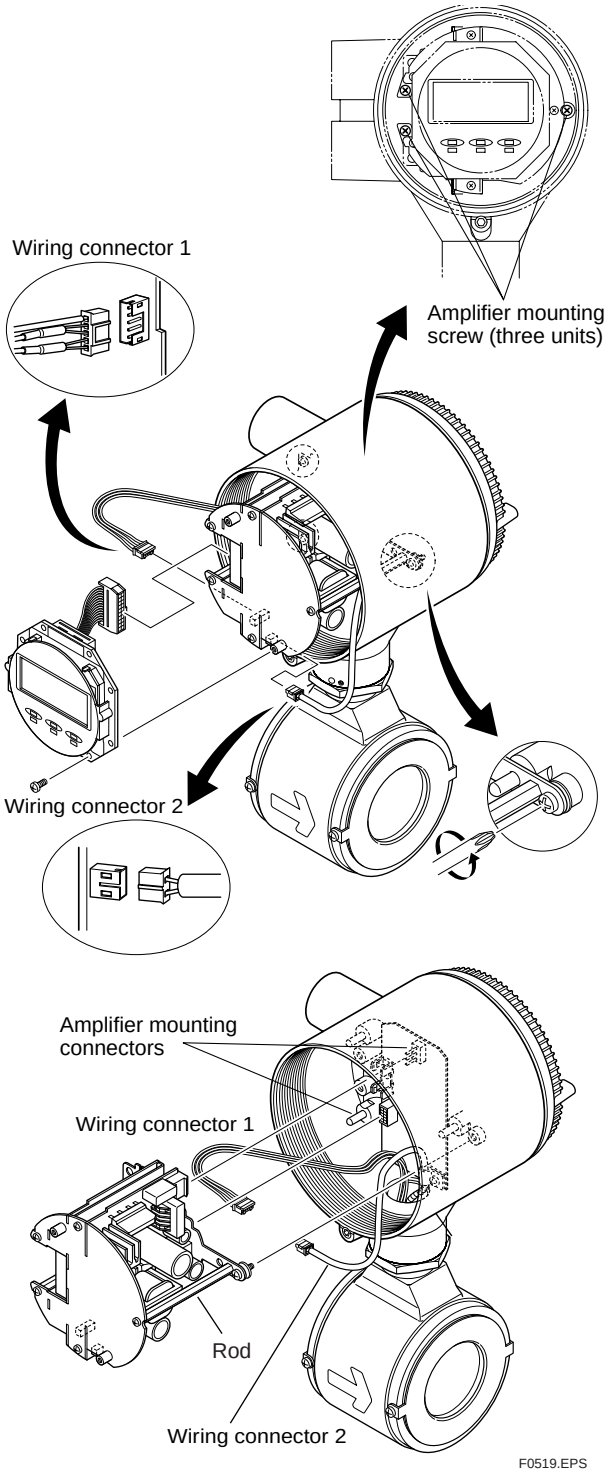


Figure 5.4.6 Assembling the Amplifier

5.5 Setting of Switches (Integral Flowmeter Only)

5.5.1 Setting of Burnout Switch

The burnout function sets the direction of current output in situations where the CPU has become damaged. Upon shipment from the manufacturing plant, the burnout direction is set to High (i.e., 25 mA); however, in cases where the optional specification code /C1 has been specified, the output direction will be set to Low (i.e., 0 mA).

Modification of the burnout direction must be carried out using the setting switch from the amplifier's CPU board (i.e., Switch 1) (See Figure 5.5.1).

Table 5.5.1 Output Setting Pins for Burnout

Position of Pin	Burnout Direction	Burnout Output	Remarks
Low High	High	25 mA	Set to High before shipment
Low High	Low	0 mA	Set to Low for option specification code /C1

T0501.EPS

NOTE

On the amplifier's CPU board, the burnout setting switch (i.e., Switch 1) and the write protect switch (i.e., Switch 2) are located adjacent to each other. Accordingly, special care should be taken when making switch settings.

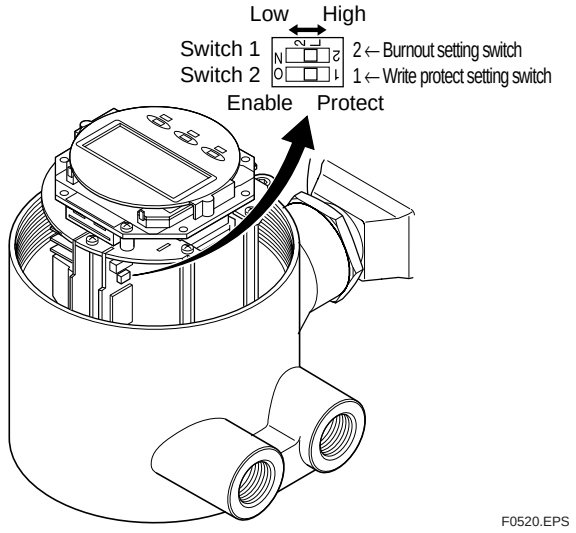


Figure 5.5.1 Switch Configuration

5.5.2 Setting of Write Protect Switch

By setting the write protect function to "Protect" it is possible to prevent the overwriting of parameters. Write protection can be carried out using either the hardware switch on the CPU board (i.e., Switch 2) or software parameter settings. If either of these items is set to "Protect," the overwriting of parameters will be prohibited.

NOTE

If the hardware switch is set to "Protect," it will not be possible to overwrite parameters; furthermore, this condition will be maintained until the switch is set to "Enable." •
In the case of FOUNDATION Fieldbus protocol, write protect setting switch is always be set as "Enable".

For more details regarding usage of the write protect function and the software's parameter switches, refer to "Chapter 6: Parameter Description" in the user's manual of the AXF Integral Flowmeter [Software Edition] (IM 01R20C02-01E-E).

5.6 Regular Inspection Items

(1) Inspection of moisture-proofing inside the terminal box: Once/year

(2) Retightening of piping joint screws: About twice/year

(3) Inspection of electrodes and lining (in case of adhesive and/or abrasive fluids, etc.)

Determine the period of regular inspection as necessary.

5.7 Excitation Coil and Insulation Resistance Check (Remote Flowtube Only)

CAUTION

- Before checking of the excitation coil and the insulation resistance, be sure that the power supply for AXFA11 or the AXFA14 converter has been turned off.
- Before checking, be sure to disconnect the cables from the terminals of the remote flowtube.

(1) Excitation Coil Check (Remote Flowtube Only)

Check that there is continuity between terminals EX1 and EX2 in the terminal box. If there is no continuity, the coils may be broken and replacement or repair of the flowtube is necessary. The coil resistance is designed to be 150 V or less. If it is not, this may be an abnormal condition. Consult Yokogawa's sales or service offices.

(2) Insulation Resistance Check (Remote Flowtube Only)

Check the insulation resistances in the terminal box in accordance with the tables below. If any of them falls below the values listed in the tables, consult Yokogawa's sales or service offices for investigation. If the insulation resistance cannot be restored, replacement or repair of the flowtube is needed. In case of submersible type flowmeters, undo the wiring connection on the converter side and measure resistance at the cable terminals.

Coil Circuit

Checking is possible even if the pipe is filled with fluid.

Test Terminals	Test Voltage	Specification
Between terminals EX1 and C	500 V DC (Use an insulation tester or the equivalent.)	1 MΩ or more

T050601.EPS

Signal Circuit

Before testing, be sure to empty and dry the interior of the pipe, checking that there is no adhesive material. Also undo the wiring connection on the converter side before testing.

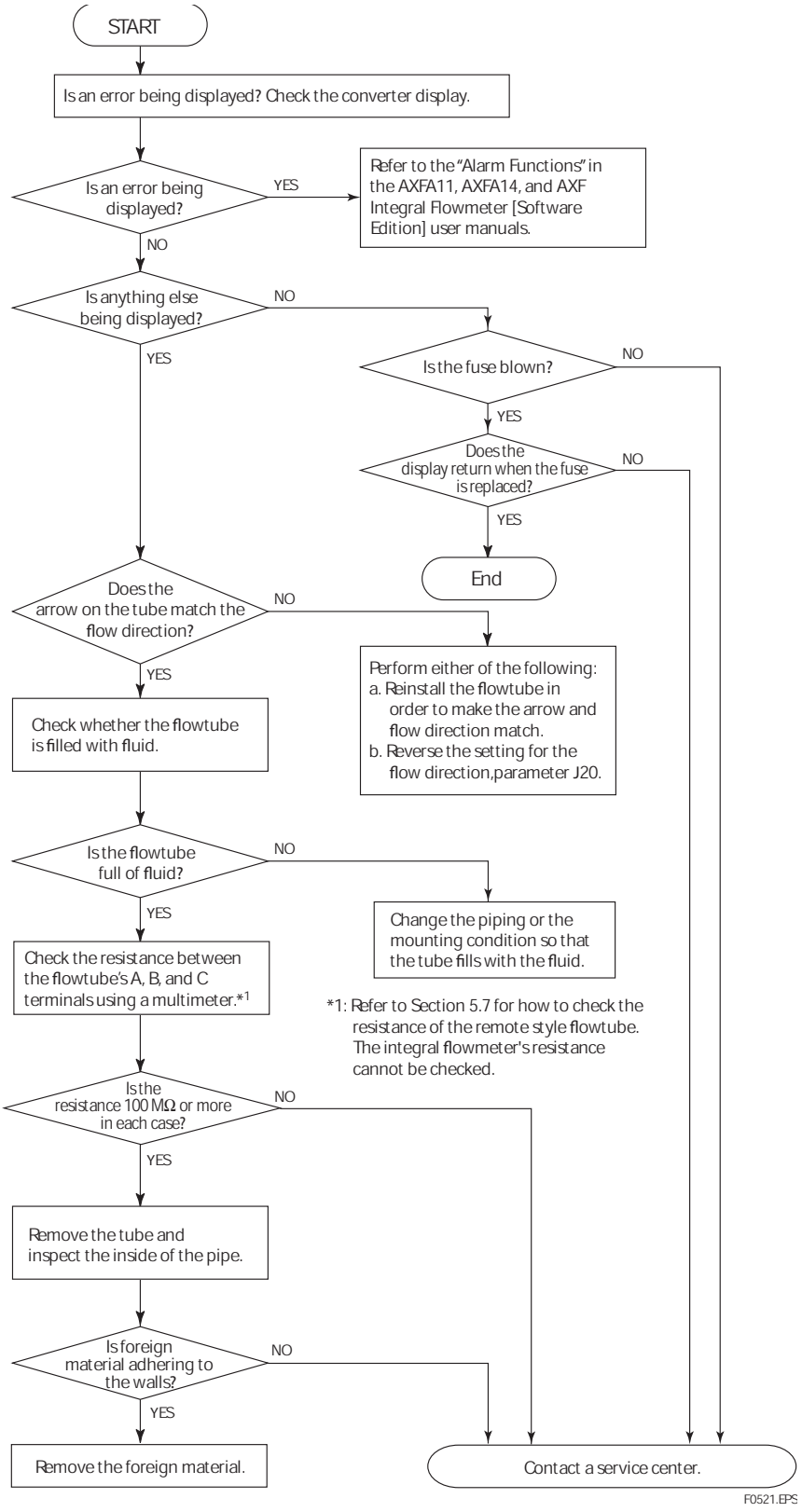
Test Terminals	Test Voltage	Specification
Between terminals A and C Between terminals B and C	500 V DC (Use an insulation tester or the equivalent.)	100 MΩ or more for each

T050602.EPS

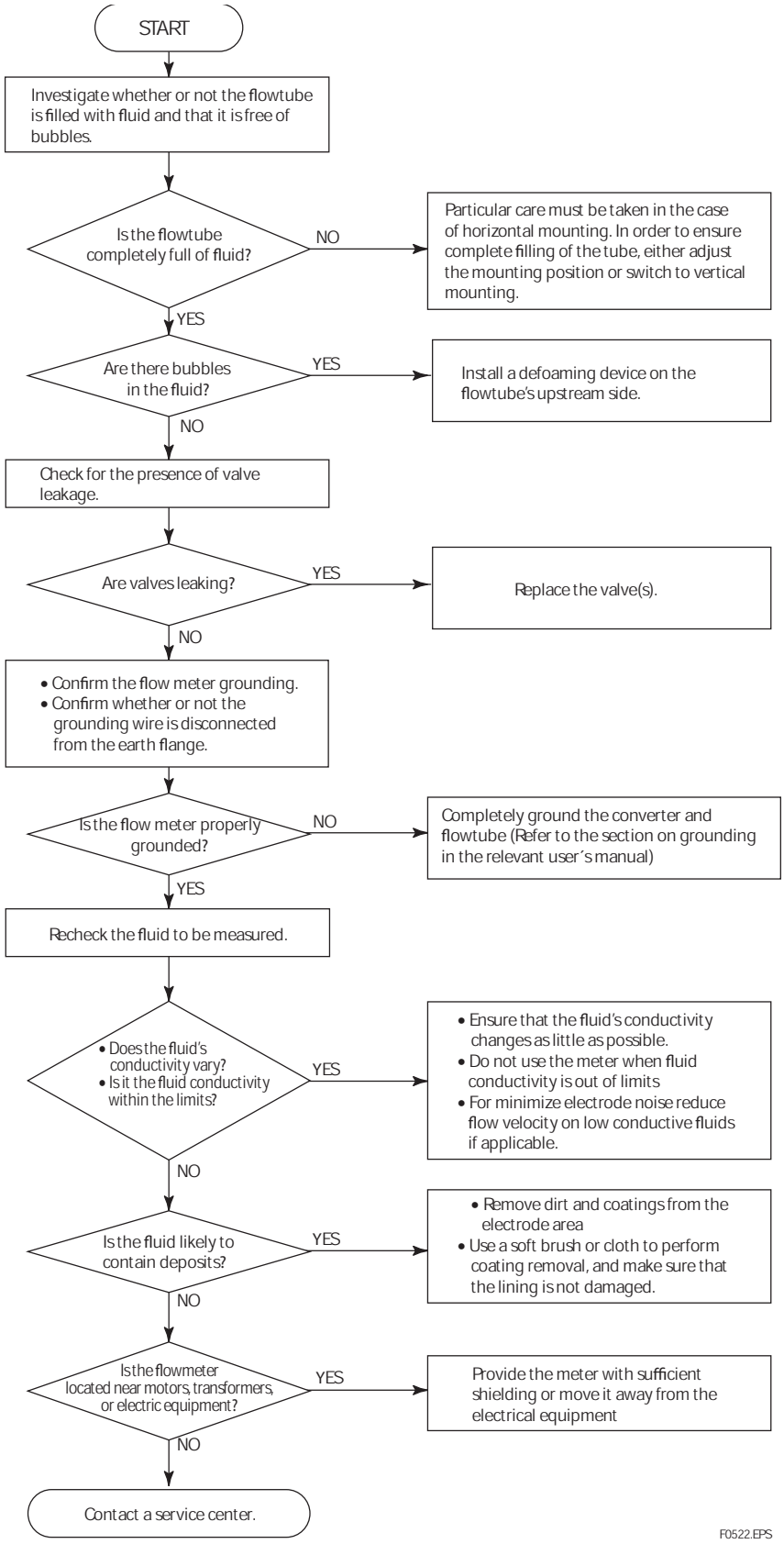
5.8 Troubleshooting

Although magnetic flowmeters rarely require maintenance, failures may occur when the instrument is not operated correctly. This section describes troubleshooting procedures where the cause of the breakdown is identified through receiver indication.

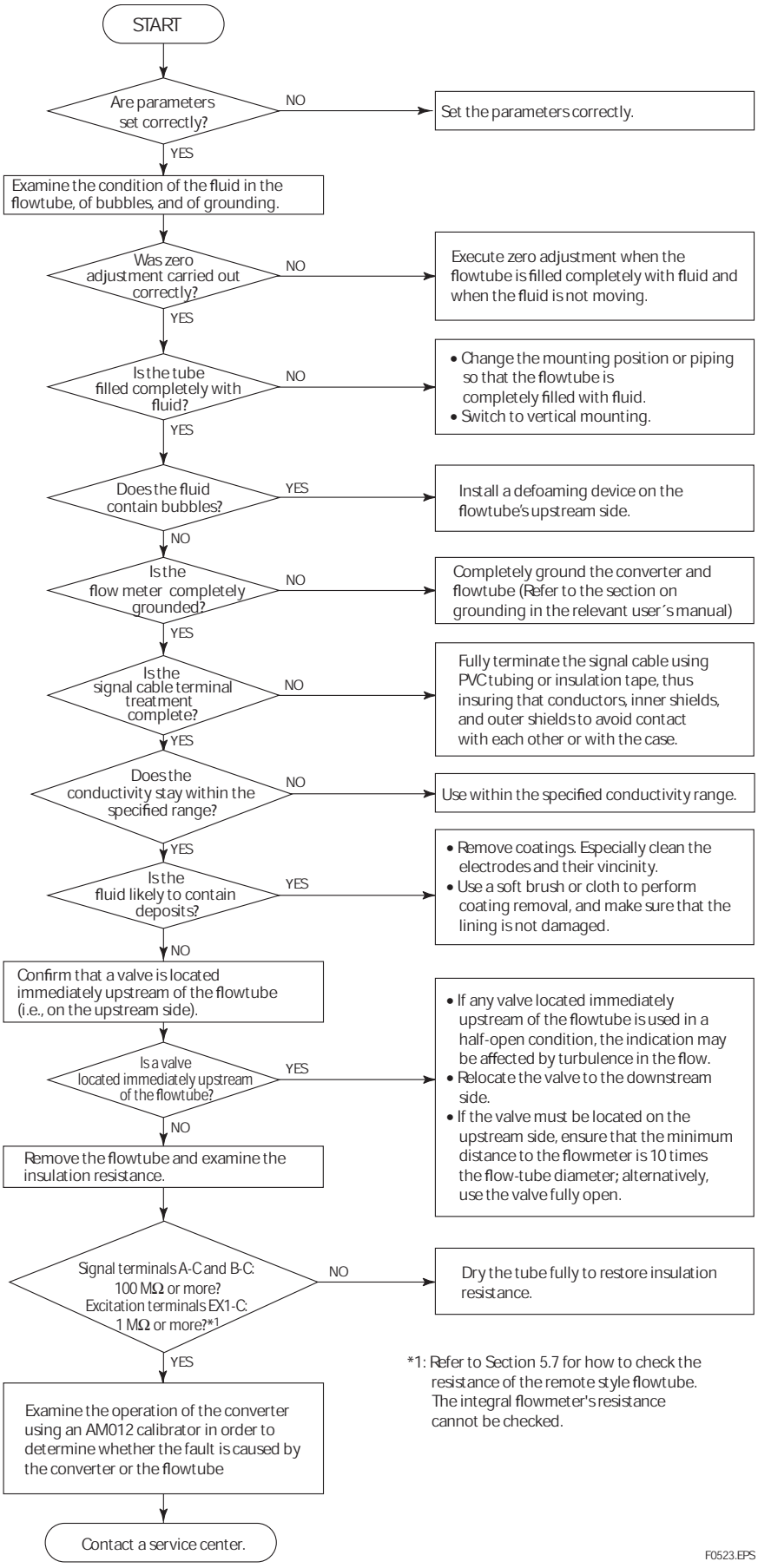
5.8.1 No Indication


START
Is an error being displayed? Check the converter display.
Is an error being displayed?
YES
Refer to the "Alarm Functions" in the AXFA11, AXFA14, and AXF Integral Flowmeter [Software Edition] user manuals.
NO
Is anything else being displayed?
NO
YES
Is the fuse blown?
NO
YES
Does the display return when the fuse is replaced?
NO
YES
End
Does the arrow on the tube match the flow direction?
NO
YES
Perform either of the following:
a. Reinstall the flowtube in order to make the arrow and flow direction match.
b. Reverse the setting for the flow direction,parameter J20.
Check whether the flowtube is filled with fluid.
Is the flowtube full of fluid?
NO
YES
Change the piping or the mounting condition so that the tube fills with the fluid.
Check the resistance between the flowtube's A, B, and C terminals using a multimeter.*1
*1: Refer to Section 5.7 for how to check the resistance of the remote style flowtube. The integral flowmeter's resistance cannot be checked.
Is the resistance 100 MΩ or more in each case?
NO
YES
Remove the tube and inspect the inside of the pipe.
Is foreign material adhering to the walls?
NO
YES
Remove the foreign material.
Contact a service center.
F0521.EPS

5.8.2 Unstable Zero


START
Investigate whether or not the flowtube is filled with fluid and that it is free of bubbles.
Is the flowtube completely full of fluid?
NO
Particular care must be taken in the case of horizontal mounting. In order to ensure complete filling of the tube, either adjust the mounting position or switch to vertical mounting.
YES
Are there bubbles in the fluid?
YES
Install a defoaming device on the flowtube's upstream side.
NO
Check for the presence of valve leakage.
Are valves leaking?
YES
Replace the valve(s).
NO
• Confirm the flow meter grounding.
• Confirm whether or not the grounding wire is disconnected from the earth flange.
Is the flow meter properly grounded?
NO
Completely ground the converter and flowtube (Refer to the section on grounding in the relevant user´s manual)
YES
Recheck the fluid to be measured.
• Does the fluid's conductivity vary?
• Is it the fluid conductivity within the limits?
YES
• Ensure that the fluid's conductivity changes as little as possible.
• Do not use the meter when fluid conductivity is out of limits
• For minimize electrode noise reduce flow velocity on low conductive fluids if applicable.
NO
Is the fluid likely to contain deposits?
YES
• Remove dirt and coatings from the electrode area
• Use a soft brush or cloth to perform coating removal, and make sure that the lining is not damaged.
NO
Is the flowmeter located near motors, transformers, or electric equipment?
YES
Provide the meter with sufficient shielding or move it away from the electrical equipment
NO
Contact a service center.
F0522.EPS

5.8.3 Disagreement Between Indication and Actual Flow


START
Are parameters set correctly?
NO
Set the parameters correctly.
YES
Examine the condition of the fluid in the flowtube, of bubbles, and of grounding.
Was zero adjustment carried out correctly?
NO
Execute zero adjustment when the flowtube is filled completely with fluid and when the fluid is not moving.
YES
Is the tube filled completely with fluid?
NO
• Change the mounting position or piping so that the flowtube is completely filled with fluid.
• Switch to vertical mounting.
YES
Does the fluid contain bubbles?
YES
Install a defoaming device on the flowtube's upstream side.
NO
Is the flow meter completely grounded?
NO
Completely ground the converter and flowtube (Refer to the section on grounding in the relevant user´s manual)
YES
Is the signal cable terminal treatment complete?
NO
Fully terminate the signal cable using PVC tubing or insulation tape, thus insuring that conductors, inner shields, and outer shields to avoid contact with each other or with the case.
YES
Does the conductivity stay within the specified range?
NO
Use within the specified conductivity range.
YES
Is the fluid likely to contain deposits?
YES
• Remove coatings. Especially clean the electrodes and their vincinity.
• Use a soft brush or cloth to perform coating removal, and make sure that the lining is not damaged.
NO
Confirm that a valve is located immediately upstream of the flowtube (i.e., on the upstream side).
Is a valve located immediately upstream of the flowtube?
YES
• If any valve located immediately upstream of the flowtube is used in a half-open condition, the indication may be affected by turbulence in the flow.
• Relocate the valve to the downstream side.
• If the valve must be located on the upstream side, ensure that the minimum distance to the flowmeter is 10 times the flow-tube diameter; alternatively, use the valve fully open.
NO
Remove the flowtube and examine the insulation resistance.
Signal terminals A-C and B-C: 100 MΩ or more?
Excitation terminals EX1-C: 1 MΩ or more?*1
NO
Dry the tube fully to restore insulation resistance.
YES
Examine the operation of the converter using an AM012 calibrator in order to determine whether the fault is caused by the converter or the flowtube
Contact a service center.
*1: Refer to Section 5.7 for how to check the resistance of the remote style flowtube. The integral flowmeter's resistance cannot be checked.
F0523.EPS

6. OUTLINE

STANDARD SPECIFICATIONS

Refer to GS 01E20F02-01E for Fieldbus communication type marked with "⊗"

Converter

Excitation Method:

- Standard dual frequency excitation:
  Size 2.5 to 400 mm (0.1 to 16 in)
- Enhanced dual frequency excitation:
  Size 25 to 200 mm (1.0 to 8.0 in)
  (for optional code /HF2)

Output Signals: "⊗"

- One Current Output: 4 to 20 mA DC (load resistance: 0 to 750 Ω maximum, including cable resistance)
- One Pulse Output (*1):
  Transistor contact output (open collector) :
  Contact capacity : 30 V DC (OFF), 200 mA (ON)
  Output rate 0.0001 to 10,000 pps (pulse/second)
- One Alarm Output (*1):
  Transistor contact output (open collector) :
  Contact capacity : 30 V DC (OFF), 200 mA (ON)
- Two Status Outputs (*1):
  Transistor contact output (open collector) :
  Contact capacity : 30 V DC (OFF), 200 mA (ON)

Input Signal: "⊗"

One Status Input: Dry contact
Load Resistance: 200 Ω or less (ON), 100 kΩ or more (OFF). (*1)

Communication Protocols:

BRAIN or HART communication signal (Superimposed on the 4 to 20 mA DC signal)

Communication Line Conditions: "⊗"

Load Resistance for BRAIN communication.:
250 to 600 Ω (including cable resistance)
Load Resistance for HART communication.:
230 to 600 Ω (including cable resistance)
Distance from Power Line: 15 cm (6 in) or more (Parallel wiring should be avoided.)

HART:

Communication Distance:
Up to 1.5 km (0.9 mile), when using multiple twisted pair cables. Communication distance varies depending on the type of cable used.

Cable Length For Specific Applications:
Use the following formula to determine the cable length for specific applications.

$$L = \frac{65 \times 10^6}{(R \times C)} - \frac{(Cf + 10{,}000)}{C}$$

where:

L = length in m or ft
R = resistance in Ω (including barrier resistance)
C = cable capacitance in pF/m or pF/ft
Cf = maximum shunt capacitance of receiving devices in pF/m or pF/ft

Note: HART is a registered trademark of the HART Communication Foundation.

BRAIN:

Communication Distance:
Up to 2 km (1.25 miles), when polyethylene insulated PVC-sheathed cables (CEV cables) are used.
Communication distance varies depending on the type of cable and wiring used.
Load Capacitance: 0.22 µF or less
Load Inductance: 3.3 mH or less
Input Impedance of Communicating Device:
10 kΩ or more (at 24 kHz)

Data Security During Power Failure:

Data (parameters, totalizer value, etc.) storage by EEPROM. No back-up battery required. (*2)

Indicator (*2) :

Full dot-matrix LCD (32×132 pixels)

Lightning Protection: "⊗"

The lightning protection is built into the current output, pulse/alarm/status input and output terminals as standard. If option code /A is selected, an additional protection is built into the power terminals.

Protection/Rating:

General-purpose / Sanitary type / Flame proof type :
IP66, IP67, NEMA 4X
Explosion proof type :
refer to description of "Enclosure" in "Hazardous Area Classification".

Coating/Paint:

Case and Cover: Polyurethane corrosion-resistant
Coating Color: Mint green coating (Munsell 5.6 BG 3.3/2.9 or its equivalent)

Converter Material:

Case and Cover : Aluminum alloy

Wiring Port Threads / Mounting:

- Electrical Connection: ANSI 1/2 NPT female
  ISO M20 x 1.5 female
- Direction of electrical connection can be changed even after delivery
  Note: In case of submersible types the direction can not be changed after delivery.
- Terminal Connections: M4 size screw terminal

Grounding:

Grounding resistance 100 Ω or less
When optional code /A is selected, grounding resistance 10 Ω or less shall be applied.

- In case of explosion proof type follow the domestic electrical requirements as regulated in each country.

*1: Select one of the following 3 choices
- 1 Pulse output, 1 Status/Alarm output
- 1 Status/Alarm output, 1 Status input
- 2 Status/Alarm outputs

*2: For models without an indicator, the hand-held terminal is necessary to set parameters.

T30.EPS

IM 01R20D01-01E-E
3rd edition, Nov. 2006

Functions "⊗"

How to Set Parameters:
The indicator's LCD and three infra-red switches enable users to set parameters without opening the cover. Parameters can also be set by means of the HHT (hand-held terminal). (*2)

Displayed Languages:
Users can choose one of the following languages : English, French, German, Italian, Japanese or Spanish. (*2)

Display Customisation:
Select
- 1- line to 3- line mode
- Flowrate as
  - Instantaneous flow rate
  - Instantaneous flow rate (%)
  - Instantaneous flow rate (bar graph)
- Current output value (mA)
- Totalized value
- Tag No.
- Electrode diagnostic results (*2)

Totalizer Functionality:
The flow rate is counted one pulse at a time according to the setting of totalization pulse weights. For forward and reverse flow measurement functions, the totalized values of the flow direction (forward or reverse) and the flow direction are displayed on the indicator together with the units. The difference of totalized values between the forward and reverse flow rate can be displayed. Totalization for the reverse flow rate is carried out only when "Forward and reverse flow measurement function" is selected (parameter F20 or F21). (*2)

Damping Time Constant:
Time constant (63% response) can be set from 0.1 s to 200.0 s. (*2)

Span / Full Scale Flow Range Setting (20mA):
Span flows can be programmed in units such as volume flow rate, mass flow rate, time, or flow rate value. The velocity unit can also be set. (*2)
Volume Flow Rate Unit:
kcf, cf, mcf, Mgal (US), kgal (US), gal (US), mgal (US), kbbl (US)*, bbl (US)*, mbbl (US)*, µbbl (US)*, Ml (Megaliter), m^3, kl (kiloliter), l (liter), cm^3
Mass Flow Rate Unit (Density must be set.):
lb (US-pound), klb (US), t (ton), kg, g
Velocity Unit: ft, m (meter)
Time Unit: s (sec), min, h (hour), d (day)
* "US oil" or "US beer" can be selected.
The converter will provide 20 mA output current at the programmed span / full scale flow range.

Pulse Output:
Scaled pulses can be generated by programming the "pulse unit" and the "pulse scale " parameters.
Pulse Width: Duty cycle 50% or fixed pulse width (0.05, 0.1, 0.5, 1, 20, 33, 50, 100 ms) can be selected arbitrarily.
Output Rate: 0.0001 to 10,000 pps (pulse/second) (*1)

Multi-range/Auto Range Span Function:
Status input enables to select up to two ranges. For automatic range switching, the status of up to four ranges can be shown in status outputs and on the indicator. (*1)(*2)

Fwd/Rev Flow Measurement Functions
Flows in both forward and reverse directions can be measured. The status is shown in status outputs and on the indicator during reverse flow measurement (parameter F20 or F21). (*1)(*2)

Totalization Switch:
The status is output if a totalized value becomes equal or greater than the set value. (*1)

Preset Totalization:
The parameter setting or status input enables the totalized value to be preset to a setting value or zero. (*1)

Positive Zero Return (PZR / 0 % Signal Lock):
Status input will force display and all outputs to 0 %. (*1)(*2)

Alarm Selection Function:
Alarms are classified into the System Alarms (hard failures), Process Alarms (such as 'Empty Pipe', 'Signal Overflow' and 'Adhesion Alarm'), Setting Alarms and Warnings. Whether alarms should be generated or not can be selected for each item. The current output generated for an alarm can be selected arbitrarily from among 2.4 mA or less, fixed to 4 mA, 21.6 mA or more, or HOLD. (*2)

Alarm Output:
Alarms are generated only for the items selected via the 'Alarm Selection Function' if relevant failures occur. (*1)

Self Diagnostic Functions:
If alarms are generated, details of the System Alarms, Process Alarms, Setting Alarms and Warnings are displayed together with concrete descriptions of countermeasures. (*2)

Flow Upper / Lower Limit Alarms:
If a flow rate becomes greater or smaller than the set value, this alarm is generated. In addition, two upper limits (H, HH) and two lower limits (L, LL) can be set. If a flow rate gets higher or lower than any of the set values, the status is output. (*1)

Adhesion (Electrode Coating) Diagnostics:
This function enables monitoring of the adhesion level of insulating substances to the electrodes. Depending on the status of adhesion, users are notified by a warning or an alarm via status outputs. If replaceable electrodes are used, they can be removed and cleaned if adhesion occurs. (*1)(*2)

*1: Select one of the following 3 choices
- 1 Pulse output, 1 Status/Alarm output
- 1 Status/Alarm output, 1 Status input
- 2 Status/Alarm outputs

*2: For models without an indicator, the hand-held terminal is necessary to set parameters.

T30.EPS

Protection/Rating:

- IP66, NEMA4X General-Purpose Use/Sanitary Style/ Explosion proof style
- IP68 (can be used for temporary submergence) Submersible Style (only for Remote Flowtube)
- In case of Explosion proof type refer to description of "Enclosure" in "Hazardous Area Classification".

Coating/Paint:

General-Purpose Use/Explosion proof Style:
Size 2.5 to 125 mm (0.1 to 5.0 in) (Wafer type),
Size 2.5 to 125 mm (0.1 to 5.0 in) (Process connection code B (-B□□) or D (-D□□) of flange type):

· Flowtube housing: No coating (Stainless steel surface)
· Flange (Flange type only): No coating (Stainless steel surface)
· Terminal Box and Cover (Remote Flowtube):
Polyurethane corrosion-resistant coating:
Coating color: Mint green (Munsell 5.6 BG 3.3/2.9 or its equivalent)
Size 150 to 300 mm (6.0 to 12 in) (Wafer type),
Size 150 to 400 mm (6.0 to 16 in) (Process connection code B of flange type),
Size 50 to 400 mm (2.0 to 16 in) (Process connection code C of flange type):
· Flowtube housing, Flange (Flange type only), Terminal Box and Cover (Remote Flowtube):
Polyurethane corrosion-resistant coating
Coating color: Mint green (Munsell 5.6 BG 3.3/2.9 or its equivalent)
- Sanitary Type:
Size 15 to 125 mm (0.5 to 5.0 in.):
· Housing: No coating (Stainless steel surface)
· Adapter : No coating (Stainless steel surface)
· Terminal Box and Cover (Remote Flowtube):
Polyurethane corrosion-resistant coating
Coating color: Mint green (Munsell 5.6 BG 3.3/2.9 or its equivalent)
- Submersible Type: Non-tar epoxy coating (black)

*1: Select one of the following 3 choices
- 1 Pulse output, 1 Status/Alarm output
- 1 Status/Alarm output, 1 Status input
- 2 Status/Alarm outputs

*2: For models without an indicator, the hand-held terminal is necessary to set parameters.

T30.EPS

Flowtubes (Remote / Integral flowmeter)

Combined Converter selection :

- A remote flowtube for sizes of up to 400 mm can be combined with the AXFA11 Converter or the AXFA14 Converter. If a combined converter is changed from AXFA11 to AXFA14 or vice versa, a new meter factor must be adjusted by flow calibrations.
- In case that size 250 mm (10 in) or larger is used in low conductivity or high concentration slurries, please use the AXFA11 Converter.
- Maximum Cable Length:
  Combination of AXF remote Flowtube and AXFA11: up to 200 m (660 ft)
  Combination of AXF remote Flowtube and AXFA14: up to 100 m (330 ft)

Available O-Ring (Replaceable electrode type only)
Fluororubber (Part number G9303SE)

Wiring port/Threads/Mounting (Remote Flowtube):

- Electrical Connection: ANSI 1/2 NPT female
  ISO M20 × 1.5 female
- Direction of Electrical Connection: The direction can be changed even after delivery.
  Note: In case of submersible types, or, or sizes of 1100 mm or larger, the direction can not be changed after delivery.
- Terminal Connection at Terminal Box: M4 size screw

Grounding:
Grounding resistance 100 Ω or less
Note: In case of explosion proof type, follow the domestic electrical requirements as regulated in each country.

Available Materials for Flowtubes

Size 2.5 mm (0.1 in) to 15 mm (0.5 in)

Part Name		Material
Flowtube housing		Stainless steel-JIS SCS11
Flange		Stainless steel-JIS SUS304 or SUSF304 (AISI 304 SS/EN 1.4301 equivalent)
Mini-Flange	Wafer Style PFA/Polyurethane Rubber lining	Stainless steel-JIS SCS13 (EN 1.4308 equivalent)
	Wafer Style Ceramics lining [only for 15 mm (0.5 in)]	Stainless steel-JIS SUS316L (AISI 316 SS/EN 1.4404 equivalent)
	Sanitary Style [only for 15 mm (0.5 in)]	Stainless steel-JIS SCS13 (EN 1.4308 equivalent)
Pipe	Wafer Style PFA/Polyurethane Rubber lining	Stainless steel-JIS SCS13 (EN 1.4308 equivalent)
	Wafer Style/Union Joint Ceramics lining	Alumina ceramics (99.9%)
	Flange Style PFA lining	Stainless steel-JIS SCS13 (EN 1.4308 equivalent) and SUS304 (AISI 304 SS/EN 1.4301 equivalent)
	Sanitary Style [only for 15 mm (0.5 in)]	Stainless steel-JIS SCS13 (EN 1.4308 equivalent)
Terminal Box (Remote Flowtube)		Aluminum alloy

T03.EPS

Size 25 mm (1 in) to 125 mm (5 in)

Part Name			Material
Flowtube housing			Stainless steel-JIS SUS304 (AISI 304 SS/EN 1.4301 equivalent)
Flange	Process Connection code: B**		Stainless steel-JIS SUS304 or SUSF304 (AISI 304 SS/EN 1.4301 equivalent)
	Process Connection code: C** [(Size 50 mm (2.0 in) to 125 mm (5.0 in)]		Carbon steel-JIS SS400
Mini-Flange	Wafer Style PFA/Polyurethane Rubber/ Natural Soft Rubber/ EPDM Rubber lining	Size 25 mm (1.0 in) (Lay Length code 1)	Stainless steel- EN 1.4308 (SCS13 equivalent)
		Size 25 mm (1.0 in) (Lay Length code 2)	Stainless steel-JIS SUS430 (ASTM 43000/DIN X6Cr17/EN 1.4016 equivalent)
		Size 32 mm (1.25 in) to 125 mm (5.0 in)	Stainless steel-JIS SUS430 (ASTM 43000/DIN X6Cr17/EN 1.4016 equivalent)
	Wafer Style Ceramics lining	Size 25 mm (1.0 in) to 50 mm (2.0 in)	Stainless steel-JIS SUS316L (AISI 316L SS/EN 1.4404 equivalent)
		Size 80 mm (3.0 in), 100 mm (4.0 in)	Stainless steel-JIS SUS304 (AISI 304 SS/EN 1.4301 equivalent)
	Sanitary Style	Size 25 mm (1.0 in)	Stainless steel-JIS SCS13 (EN 1.4308 equivalent)
		Size 32 mm (1.25 in) to 125 mm (5.0 in)	Stainless steel-JIS SUS304 (AISI 304 SS/EN 1.4301 equivalent)
Pipe	Wafer Style PFA/Polyurethane Rubber/ Natural Soft Rubber/ EPDM Rubber lining	Size 25 mm (1.0 in) (Lay Length code 1)	Stainless steel- EN 1.4308 (SCS13 equivalent)
		Size 25 mm (1.0 in) (Lay Length code 2)	Stainless steel-JIS SUS304 (AISI 304 SS/EN 1.4301 equivalent)
		Size 32 mm (1.25 in) to 125 mm (5.0 in)	Stainless steel-JIS SUS304 (AISI 304 SS/EN 1.4301 equivalent)
	Flange Style PFA/Polyurethane Rubber/ Natural Soft Rubber/ EPDM Rubber lining	Size 25 mm (1.0 in)	Stainless steel- EN 1.4308 (SCS13 equivalent)
		Size 32 mm (1.25 in) to 125 mm (5.0 in)	Stainless steel-JIS SUS304 (AISI 304 SS/EN 1.4301 equivalent)
	Wafer Style Ceramics lining	Size 25 mm (1.0 in) to 100 mm (4.0 in)	Alumina ceramics (99.9%)
	Sanitary Style	Size 25 mm (1.0 in)	Stainless steel-JIS SCS13 (EN 1.4308 equivalent)
		Size 32 mm (1.25 in) to 125 mm (5.0 in)	Stainless steel-JIS SUS304 (AISI 304 SS/EN 1.4301 equivalent)
Terminal Box (Remote Flowtube)			Aluminum alloy

T04.EPS

Size 150 mm (6 in) to 400 mm (16 in)

Part Name		Material
Flowtube housing		Carbon steel-JIS SPCC
Flange	Process Connection code: B**	Stainless steel-JIS SUS304 or SUSF304 (AISI 304 SS/EN 1.4301 equivalent)
	Process Connection code: C**	Carbon steel-JIS SS400
Mini-Flange	Wafer Style PFA/Polyurethane Rubber/Natural Soft Rubber/ EPDM Rubber lining	Carbon steel-JIS SS400
	Wafer Style Ceramics lining [available with 150 mm (6.0 in), 200 mm (8.0 in)]	Stainless steel-JIS SUS304 (AISI 304 SS/EN 1.4301 equivalent)
Pipe	Flange Style /Wafer Style PFA/Polyurethane Rubber/Natural Soft Rubber/ EPDM Rubber lining	Stainless steel-JIS SUS304 (AISI 304 SS/EN 1.4301 equivalent)
	Wafer Style Ceramics lining [available with 150 mm (6.0 in), 200 mm (8.0 in)]	Alumina ceramics (99.9%)
Terminal Box (Remote Flowtube)		Aluminum alloy

T05.EPS

Available Materials for Lining:

Fluorocarbon PFA*1 lining
Polyurethane Rubber lining
Natural Soft Rubber lining*2
EPDM Rubber lining*3
Alumina ceramics lining

*1: PFA is FDA (U.S. Food and Drug Administration) approval material.
*2: Natural soft rubber is a material which can reduce wear of the lining due to fluids mixed with slurries.
If the concentration of mixed slurries is high, contact Yokogawa as necessary measures need to be taken separately for the electrodes.
*3: EPDM rubber lining is superior in the ozone proof.

Available Material for Electrodes:

Stainless steel, JIS SUS316L (AISI 316L SS/EN 1.4404 or its equivalent)
Hastelloy C276 / 2.4819 or its equivalent (*1)
Titanium, Tantalum, Platinum-Iridium,
Tungsten Carbide, Platinum-Alumina cermet (only for ceramic lining).
Note : For sanitary type SUS316L only

Electrode Construction:

Non-replaceable Electrode Style

Externally Inserted :
In all General-Purpose Use, Submersible style and Explosion proof style flowtubes with PFA or polyurethane rubber liner.
Internally Inserted :
In all Sanitary style flowtubes (AXF□□□H)
In all EPDM lined flowtubes (-□□G□□□)
Integral / sinterfused:
In all flowtubes with ceramic lining.

Replaceable Electrode Style

A cassette electrode can be mounted/dismounted into unit to facilitate removing or mounting at customer site.
The optional dedicated tool (F9807SK/Z with Z = KEM 00667-01) is required.

*1: Hastelloy is a registered trademark of Haynes International Inc.

Replacable electrodes are available for the followingAXF standard:

Use	Process Connection	Available Size	Lining	Electrode Material
General-Purpose Use	Wafer	25 to 300 mm (1.0 to 12 in)	PFA/ Polyurethane Rubber	JIS SUS316L (AISI 316L SS/EN 1.4404 equivalent)(*1)
	Flange	25 to 400 mm (1.0 to 16 in)		

T06.EPS

Replacement model for earlier ADMAG or ADMAG AE:

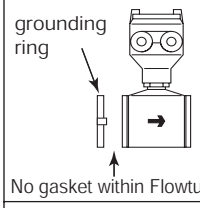
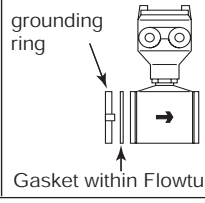
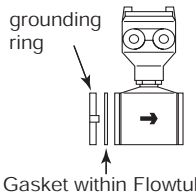
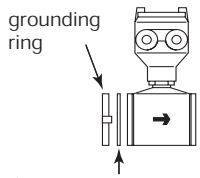
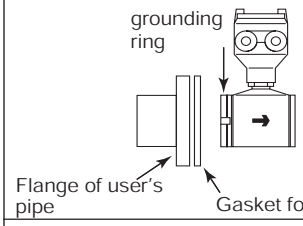
Use	Process Connection	Available Size	Lining	Electrode Material
General-Purpose Use	Flange	150 to 250 mm (6.0 to 10 in)	PFA/ Polyurethane Rubber	JIS SUS316L (AISI 316L SS/EN 1.4404 equivalent)(*1)

T07.EPS

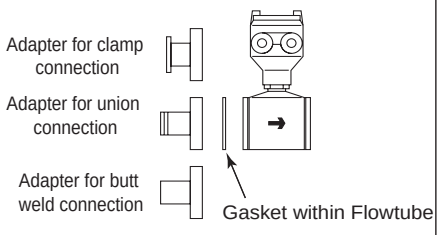
Available Materials for Grounding Rings / Grounding Electrodes:

- Grounding Ring (plate type)
  Stainless steel JIS SUS316L (AISI 316L SS/EN 1.4404 or its equivalent),
  Hastelloy*2 C276 / 2.4819 or its equivalent,
  Titanium.
- Grounding Electrode (electrode type)*3
  Fluorocarbon PFA lining + grounding electrodes (when Tantalum or Platinum-Iridium is selected)

*1: If any other electrode materials are required, please contact Yokogawa office.
*2: Hastelloy is a registered trademark of Haynes International Inc.
*3: Available with sizes 2.5 to 200 mm (0.1 to 8.0 in), PFA and ceramics lining only.

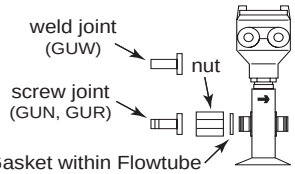
<table>
<tr><th>Use</th><th colspan="2">General-Purpose Use/Submersible Style/
Explosion proof Style</th></tr>
<tr><td>Lining</td><td>PFA/Polyurethane Rubber/
Natural Soft Rubber/
EPDM Rubber</td><td>Ceramics</td></tr>
<tr><td rowspan="3">Standard</td><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">Gasket Material (within Flowtube)</td></tr>
<tr><td>—</td><td>Fluororesin with ceramic fillers (Valqua #7020)</td></tr>
<tr><td rowspan="3">Optional code (GA, GC, GD, or GF)
(Only when selecting the PFA lining/ ceramics lining)</td><td> 
</td><td> 
</td></tr>
<tr><td colspan="2">Gasket Material (within Flowtube)</td></tr>
<tr><td colspan="2">GA: Fluororubber for PVC pipes (Viton®)
GC: Acid-resistant fluororubber for PVC pipes (Viton®)
GD: Alkali-resistant fluororubber for PVC pipes (Viton®)
GF*1: Fluororesin with alkali-resistant carbons for metal pipes
*1: GF is applicable only for ceramics lining.</td></tr>
<tr><td rowspan="3">Optional code (BSF or BSC)</td><td colspan="2"> 
</td></tr>
<tr><td colspan="2">Gasket Material (for user's flange)</td></tr>
<tr><td colspan="2">BSF: PTFE-sheathed non-asbestos
BSC: Chloroprene rubber</td></tr>
</table>

T23-1.EPS

<table>
<tr><th>Use</th><th>Sanitary Style</th></tr>
<tr><td>Lining</td><td>PFA</td></tr>
<tr><td rowspan="3">Standard</td><td> 
</td></tr>
<tr><td>Gasket Material (within Flowtube)</td></tr>
<tr><td>EPDM (ethylene propylene) rubber
Tmax = 150˚C ; CIP capable</td></tr>
<tr><td>Optional code (GH)</td><td>GH: Silicone rubber
Tmax = 160˚C ; CIP capable</td></tr>
</table>

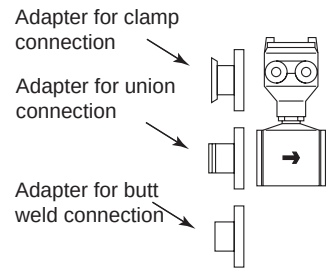
T23-2.EPS

Available Joints :

Lining	Ceramics Union Joints (size 10 mm or less)	
Standard		
	Materials for Union Joint	
	Process Connection Code GUW: Union Joint (weld joint)	Stainless steel (JIS SUS316L (ANSI 316L SS/EN 1.4404 equivalent))
	Process Connection Code GUN, GUR: union joint (screw joint)	

Note: Contact Yokogawa office if PVC union joint is required.

T23-3.EPS

Use	Sanitary Style
Standard	
	Materials for Adapters (clamp, union, butt weld)
	Stainless steel (JIS SUS316L (ANSI 316L SS/EN 1.4404 equivalent))

T23-4.EPS

Overview about Sizes, Styles and Options

Unit: mm (in.)

Use	Process Connection	Lining	Remote Flowtube	Integral Flowmeter	High Grade Accuracy 0.2% of Rate (*3)	Enhanced Dual Frequency Excitation (Optional code HF2) (*3)	Replaceable Electrode (Electrode structure code 2)
General-purpose use	Wafer	PFA	2.5 (0.1), 5 (0.2), 10 (0.4), 15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12)		25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12)
		Polyurethane rubber	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12)		—	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12)
		Ceramics (*1)	15 (0.5), 25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)		25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)	25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)	—
	Flange	PFA	2.5 (0.1), 5 (0.2), 10 (0.4), 15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12), 350 (14), 400 (16)		25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12), 350 (14), 400 (16)
		Polyurethane rubber	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12), 350 (14), 400 (16)		—	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12), 350 (14), 400 (16)
	Union Joint	Ceramics (*2)	2.5 (0.1), 5 (0.2), 10 (0.4)		—	—	—
Submersible Type	Wafer	PFA	15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5) 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12)	—	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
		Polyurethane rubber	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12)	—	—	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
	Flange	PFA	15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12), 350 (14), 400 (16)	—	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
		Polyurethane rubber	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12), 350 (14), 400 (16)	—	—	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
Explosion proof Type	Wafer	PFA	2.5 (0.1), 5 (0.2), 10 (0.4), 15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12)		25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
		Ceramics (*1)	15 (0.5), 25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)		25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)	25(1.0),40(1.5),50(2.0), 80(3.0),100(4.0), 150(6.0),200(8.0)	—
	Flange	PFA	2.5 (0.1), 5 (0.2), 10 (0.4), 15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12), 350 (14), 400 (16)		25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
	Union Joint	Ceramics (*2)	2.5 (0.1), 5 (0.2), 10 (0.4)		—	—	—
Sanitary Type (*7)	Clamp: Tri-Clamp (*4), DIN32676 ISO2852/SMS3016 Union: DIN11851 ISO2853 (*5) SMS1145 (*6) Butt Weld: DIN11850, ISO2037	PFA	15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0)		25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0)	—

T21.EPS

*1: AXF standard lay length dimensions for wafer type ceramics linings are the same as those for ADMAG ceramics linings.
*2: AXF standard lay length dimensions for union joint type ceramics linings are the same as those for ADMAG ceramics linings.
*3: Enhanced dual frequency excitation is not available for models with High grade accuracy
*4: Not available with 32 mm (1.25 in.), 125 mm (5.0 in.)
*5: Not available with 125 mm (5.0 in.)
*6: Not available with 15 mm (0.5 in.), 125 mm (5.0 in.)
*7: Material: Stainless steel (JIS SUS316L (ANSI 316L SS/EN 1.4404 equivalent))

Unit: mm (in)

Use	Process Connection	Lining	Remote Flowtube	Integral Flowmeter	High Grade Accuracy 0.2% of Rate (*3)	Enhanced Dual Frequency Excitation (Optional code HF2) (*3)	Replaceable Electrode (Electrode structure code 2)
Submersible Style	Wafer	PFA	15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5) 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12)	—	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
		Polyurethane Rubber	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12)	—	—	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
		Natural Soft Rubber	50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12)	—	—	50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
		EPDM Rubber	50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12)	—	—	50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
	Flange	PFA	15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12), 350 (14), 400 (16)	—	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
		Polyurethane Rubber	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12), 350 (14), 400 (16), 500(20), 600 (24), 700 (28), 800 (32), 900(36), 1000(40), 1100(44), 1200(48), 1350(54), 1500(60), 1600(64), 1800(72), 2000(80), 2200(88), 2400(96), 2600(104)	—	—	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
		Natural Soft Rubber	50 (2.0), 65 (2.5), 80(3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12), 350 (14), 400 (16)	—	—	50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
		EPDM Rubber	50 (2.0), 65 (2.5), 80(3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10) 300 (12), 350 (14), 400 (16)	—	—	50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
Explosion proof Style	Wafer	PFA	2.5 (0.1), 5 (0.2), 10 (0.4), 15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12)		25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
		Ceramics (*1)	15 (0.5), 25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)		25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)	25(1.0),40(1.5),50(2.0), 80(3.0),100(4.0), 150(6.0),200(8.0)	—
	Flange	PFA	2.5 (0.1), 5 (0.2), 10 (0.4), 15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0), 250 (10), 300 (12), 350 (14), 400 (16)		25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0), 150 (6.0), 200 (8.0)	—
	Union Joint	Ceramics (*2)	2.5 (0.1), 5 (0.2), 10 (0.4)		—	—	—
Sanitary Style (*7)	Clamp: Tri-Clamp (*4), DIN32676 ISO2852/SMS3016 Union: DIN11851 ISO2853 (*5) SMS1145 (*6) Butt Weld: DIN11850, ISO203	PFA	15 (0.5), 25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0)		25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0)	25 (1.0), 32 (1.25), 40 (1.5), 50 (2.0), 65 (2.5), 80 (3.0), 100 (4.0), 125 (5.0)	—

T21-2.EPS

*1: AXF standard lay length dimensions for wafer type ceramics linings are the same as those for ADMAG ceramics linings.
*2: AXF standard lay length dimensions for union joint type ceramics linings are the same as those for ADMAG ceramics linings.
*3: Enhanced dual frequency excitation is not available for models with High grade accuracy.
*4: Not available with 32 mm (1.25 in), 125 mm (5.0 in)
*5: Not available with 125 mm (5.0 in)
*6: Not available with 15 mm (0.5 in), 125 mm (5.0 in)
*7: Material of process connections is always 316L

HAZARDOUS AREA CLASSIFICATION

CENELEC ATEX (KEMA):

All instruction manuals for ATEX Ex-related products are available in English, German and French. Should you require Ex-related instructions in your local language, you have to contact your nearest Yokogawa office or representative.

No. KEMA03ATEX2435
AXF002C - AXF400C
Applicable Standards:
EN 50014, EN 50018, EN 50019, EN 50020,
EN 50028, EN 50281-1-1, EN 60529, EN 61010-1

(Integral Flowmeter)

CENELEC ATEX (KEMA) Flame proof Type

Group II Category 2G
EEx dme[ia] IIC T6...T3
Electrode Circuit Um: 250 V AC/DC
Excitation Circuit: 140 V max.
Enclosure: IP66/IP67
Maximum Power Supply Voltage: 250 V AC / 130 V DC
Excitation Circuit: 140 V max.
Enclosure: IP66/IP67
Temperature Class:

Temperature Code	Max. Process Temperature	Min. Process Temperature
T6	+70 ˚C (+158 ˚F)	-40 ˚C (-40 ˚F)
T5	+85 ˚C (+185 ˚F)	-40 ˚C (-40 ˚F)
T4	+120 ˚C (+248 ˚F)	-40 ˚C (-40 ˚F)
T3	+130 ˚C (+266 ˚F)	-40 ˚C (-40 ˚F)

T27.EPS

Ambient Temp.: -40 °C to +60 °C (-40 °F to +140 °F)

CENELEC ATEX (KEMA) Type of Protection “Dust”

Group II Category 1D
Electrode Circuit Um: 250 V AC/DC
Maximum Power Supply Voltage: 250 V AC / 130 V DC
Excitation Circuit: 140 V max.
Enclosure: IP66/IP67
Maximum Surface Temperature :

Max. Surface Temperature	Max. Process Temperature
T75 ˚C (+167 ˚F)	+70 ˚C (+158 ˚F)
T85 ˚C (+185 ˚F)	+85 ˚C (+185 ˚F)
T100 ˚C (+212 ˚F)	+120 ˚C (+248 ˚F)
T110 ˚C (+230 ˚F)	+130 ˚C (+266 ˚F)

T29-1.EPS

Ambient Temp.: -40 °C to +60 °C (-40 °F to +140 °F)

(Remote Flowtube)

CENELEC ATEX (KEMA) Flame proof Type

KEMA03ATEX2435
Group II Category 2G
EEx dme[ia] IIC T6...T3
Electrode Circuit Um: 250 V AC/DC
Excitation Circuit: 170 V max.
Enclosure: IP66/IP67
Temperature Class :

Temperature Code	Max. Process Temperature	Min. Process Temperature
T6	+70 ˚C (+158 ˚F)	-40 ˚C (-40 ˚F)
T5	+85 ˚C (+185 ˚F)	-40 ˚C (-40 ˚F)
T4	+120 ˚C (+248 ˚F)	-40 ˚C (-40 ˚F)
T3	+150 ˚C (+302 ˚F)	-40 ˚C (-40 ˚F)

T28.EPS

Ambient Temp. : -40 °C to +60 °C (-40 °F to +140 °F)

CENELEC ATEX (KEMA) Type of Protection “Dust”

Group II Category 1D
Electrode Circuit Um: 250 V AC/DC
Excitation Circuit : 170 V max.
Enclosure: IP66/IP67
Maximum SurfaceTtemperature:

Max. Surface Temperature	Max. Process Temperature
T75 ˚C (+167 ˚F)	+70 ˚C (+158 ˚F)
T85 ˚C (+185 ˚F)	+85 ˚C (+185 ˚F)
T100 ˚C (+212 ˚F)	+120 ˚C (+248 ˚F)
T115 ˚C (+239 ˚F)	+150 ˚C (+302 ˚F)

T29.EPS

Ambient Temp.: -40 °C to +60 °C (-40 °F to +140 °F)

FM:

AXF002C - AXF400C

Applicable Standards:

FM3600, FM3610, FM3615, FM3810, ANSI/NEMA 250

(Integral flowmeter)

Explosion proof Class I, Division 1, Groups A, B, C & D

Dust ignition proof Class II/III, Division 1, Groups E, F & G

Intrinsically safe (electrodes) Class I, Division 1, Groups A, B, C & D

"SEAL ALL CONDUITS WITHIN 18 INCHES"

"WHEN INSTALLED IN DIV.2, SEALS NOT REQUIRED"

Electrode circuit Vmax: 250 VAC/DC

Maximum Power Supply Voltage: 250 V AC / 130 V DC

Excitation Circuit: 140 V max.

Enclosure: NEMA 4X

Temperature Code: T6 (refer to following table)

Temperature Code	Max. Process Temperature	Min. Process Temperature
T6	+70 ˚C (+158 ˚F)	-40 ˚C (-40 ˚F)
T5	+85 ˚C (+185 ˚F)	-40 ˚C (-40 ˚F)
T4	+120 ˚C (+248 ˚F)	-40 ˚C (-40 ˚F)
T3	+130 ˚C (+266 ˚F)	-40 ˚C (-40 ˚F)

T27.EPS

Ambient Temp.: -40 °C to +60 °C (-40 °F to +140 °F)

(Remote Flowtube)

Explosion proof Class I, Division 1, Groups A, B, C & D

Dust ignition proof Class II/III, Division 1, Groups E, F & G

Intrisically safe (electrodes) Class I, Division 1, Groups A, B, C & D

"SEAL ALL CONDUITS WITHIN 18 INCHES"

"WHEN INSTALLED IN DIV.2,SEALS NOT REQUIRED"

Electrode Circuit Vmax: 250 VAC/DC

Excitation Circuit: 170 V max.

Enclosure: NEMA 4X

Temperature Code: T6 (refer to following table)

Temperature Code	Max. Process Temperature	Min. Process Temperature
T6	+70 ˚C (+158 ˚F)	-40 ˚C (-40 ˚F)
T5	+85 ˚C (+185 ˚F)	-40 ˚C (-40 ˚F)
T4	+120 ˚C (+248 ˚F)	-40 ˚C (-40 ˚F)
T3	+150 ˚C (+302 ˚F)	-40 ˚C (-40 ˚F)

T28.EPS

Ambient Temp. : -40 °C to +60 °C (-40 °F to +140 °F)

Note·Installation shall be in accordance with the manufacturer´s instructions and National Electric code, ANSI/NFPA-70.

CSA:

AXF002C - AXF400C

Applicable Standards:

For CSA C22.2 Series:

C22.2 No 0, C22.2 No 0.4, C22.2 No 0.5, C22.2 No 25, C22.2 No 30, C22.2 No 94, C22.2 No 157, C22.2 No 1010.1

For CSA E79 Series:

CAN/CSA-E79-0, CAN/CSA-E79-1, CAN/CSA-E79-7, CAN/CSA-E79-11, CAN/CSA-E79-18

Certificate: 1481213

(Integral flowmeter)

For CSA C22.2 Series

Explosion proof Class I, Division 1, Groups A, B, C & D

Dust ignition proof Class II/III, Division 1, Groups E, F & G

Intrisically safe (electrodes) Class I, Division 1, Groups A, B, C & D

"SEAL ALL CONDUITS WITHIN 50cm of the enclosure"

"WHEN INSTALLED IN DIV.2,SEALS NOT REQUIRED"

Electrode Circuit Vmax: 250 V AC/DC

Maximum Power Supply Voltage 250 V AC / 130 V DC

Excitation Circuit: 140 V max.

Enclosure: NEMA 4X

Temperature Code: (refer to following table)

Temperature Code	Max. Process Temperature	Min. Process Temperature
T6	+70 ˚C (+158 ˚F)	-40 ˚C (-40 ˚F)
T5	+85 ˚C (+185 ˚F)	-40 ˚C (-40 ˚F)
T4	+120 ˚C (+248 ˚F)	-40 ˚C (-40 ˚F)
T3	+130 ˚C (+266 ˚F)	-40 ˚C (-40 ˚F)

T27.EPS

Ambient Temp.: -40 °C to +60 °C (-40 °F to +140 °F)

For CSA E79 Series

Flame proof zone 1, Ex dme[ia IIC T6...T3

Intrinsically safe (electrodes), Ex ia IIC T6...T3

Electrode Circuit Vmax: 250 VAC/DC

Maximum Power Supply Voltage: 250 V AC / 130 V DC

Excitation Circuit: 140 V max.

Enclosure: NEMA 4X

Temperature Code: (refer to following table)

Temperature Code	Max. Process Temperature	Min. Process Temperature
T6	+70 ˚C (+158 ˚F)	-40 ˚C (-40 ˚F)
T5	+85 ˚C (+185 ˚F)	-40 ˚C (-40 ˚F)
T4	+120 ˚C (+248 ˚F)	-40 ˚C (-40 ˚F)
T3	+150 ˚C (+302 ˚F)	-40 ˚C (-40 ˚F)

T28.EPS

Ambient Temp.: -40 °C to +60 °C (-40 °F to +140 °F)

(Remote Flowtube)

For CSA C22.2 Series

Explosion proof Class I, Division 1, Groups A, B, C & D

Dust ignition proof Class II/III, Division 1, Groups E, F & G

Intrinsically safe (electrodes) Class I, Division 1, Groups A, B, C & D

"SEAL ALL CONDUITS WITHIN 18 INCHES"

"WHEN INSTALLED IN DIV.2,SEALS NOT REQUIRED"

Electrode Circuit Vmax: 250 V AC/DC

Excitation Circuit: 170 V max.

Enclosure: NEMA 4X

Temperature Code: T6 (refer to following table)

Temperature Code	Max. Process Temperature	Min. Process Temperature
T6	+70 ˚C (+158 ˚F)	-40 ˚C (-40 ˚F)
T5	+85 ˚C (+185 ˚F)	-40 ˚C (-40 ˚F)
T4	+120 ˚C (+248 ˚F)	-40 ˚C (-40 ˚F)
T3	+150 ˚C (+302 ˚F)	-40 ˚C (-40 ˚F)

T28.EPS

Ambient Temp.: -40 °C to +60 °C (-40 °F to +140 °F)

For CSA E79 Series

Flame proof zone 1, Ex dme [ia IIC T6...T3

Intrinsically safe (electrodes), Ex ia IIC T6...T3

Electrode Circuit Vmax: 250 V AC/DC

Excitation Circuit: 170 V max.

Enclosure Type 4X/IP66/IP67

Temperature Code: T6 (refer to following table)

Temperature Code	Max. Process Temperature	Min. Process Temperature
T6	+70 ˚C (+158 ˚F)	-40 ˚C (-40 ˚F)
T5	+85 ˚C (+185 ˚F)	-40 ˚C (-40 ˚F)
T4	+120 ˚C (+248 ˚F)	-40 ˚C (-40 ˚F)
T3	+150 ˚C (+302 ˚F)	-40 ˚C (-40 ˚F)

T28.EPS

IECEx:

AXF002C – AXF400C

Applicable Standard:

IEC 60079-0: 2004, IEC 60079-1: 2003,
IEC 60079-7: 2001,
IEC 60079-11: 1999, IEC 60079-18: 2004,
IEC 61241-0: 2004, IEC 61241-1: 2004,
IEC 60529: 1999 + Edition 2.1: 2001

Certificate: IECEx KEM 05.0018

(Integral Flowmeter)

IECEx Flameproof Type

Ex dem[ia] IIC T6...T3

Electrode Circuit Vmax: 250 V AC/DC

Maximum Power Supply Voltage: 250 V AC/130 V DC

Excitation Circuit: 140 V max

Enclosure: IP66/IP67

Temperature Class:

Temperature Class	Process Temperature
T6	-40 ˚C to +70 ˚C (-40 ˚F to +158 ˚F)
T5	-40 ˚C to +85 ˚C (-40 ˚F to +185 ˚F)
T4	-40 ˚C to +120 ˚C (-40 ˚F to +248 ˚F)
T3	-40 ˚C to +130 ˚C (-40 ˚F to +266 ˚F)

T27-3.EPS

Ambient Temp.:

PFA Lining; –40 °C to +60 °C (–40 °F to +140 °F)

Ceramics Lining; –15 °C to +60 °C (5 °F to +140 °F)

IECEx Type of Protection "Dust"

Ex tD A21 IP6x T95 °C, T105 °C, T120 °C, T130 °C

Electrode Circuit Um: 250 V AC/DC

Maximum Power Supply Voltage: 250 V AC/130 V DC

Excitation Circuit: 140 V max

Enclosure: IP66/IP67

Maximum Surface Temperature:

Maximum Surface Temperature	Process Temperature
T95 ˚C (+203 ˚F)	-40 ˚C to +70 ˚C (-40 ˚F to +158 ˚F)
T105 ˚C (+221 ˚F)	-40 ˚C to +85 ˚C (-40 ˚F to +185 ˚F)
T120 ˚C (+248 ˚F)	-40 ˚C to +120 ˚C (-40 ˚F to +248 ˚F)
T130 ˚C (+266 ˚F)	-40 ˚C to +130 ˚C (-40 ˚F to +266 ˚F)

T27-7.EPS

Ambient Temp.:

PFA Lining: -40 °C to +60 °C (-40 °F to +140 °F)

Ceramics Lining: -15 °C to +60 °C (5 °F to +140 °F)

(Remote Flowtube)
IECEx Flameproof Type
Ex demb[ia] IIC T6...T3
Electrode Circuit Um: 250 V AC/DC
Excitation Circuit: 170 V max
Enclosure: IP66/IP67
Temperature Class:

Temperature Class	Process Temperature
T6	-40 ˚C to +70 ˚C (-40 ˚F to +158 ˚F)
T5	-40 ˚C to +85 ˚C (-40 ˚F to +185 ˚F)
T4	-40 ˚C to +120 ˚C (-40 ˚F to +248 ˚F)
T3	-40 ˚C to +150 ˚C (-40 ˚F to +302 ˚F)

T27-5.EPS

Ambient Temp.:
PFA Lining: -40 °C to +60 °C (-40 °F to +140 °F)
Ceramics Lining: -15 °C to +60 °C (5 °F to +140 °F)

IECEx Type of Protection "Dust"
Ex tD A21 IP6x T95 °C, T105 °C, T120 °C, T135 °C
Electrode Circuit Um: 250 V AC/DC
Excitation Circuit: 170 V max
Enclosure: IP66/IP67
Maximum Surface Temperature:

Maximum Surface Temperature	Process Temperature
T95 ˚C (+203 ˚F)	-40 ˚C to +70 ˚C (-40 ˚F to +158 ˚F)
T105 ˚C (+221 ˚F)	-40 ˚C to +85 ˚C (-40 ˚F to +185 ˚F)
T120 ˚C (+248 ˚F)	-40 ˚C to +120 ˚C (-40 ˚F to +248 ˚F)
T135 ˚C (+275 ˚F)	-40 ˚C to +150 ˚C (-40 ˚F to +302 ˚F)

T27-6.EPS

Ambient Temp.:
PFA Lining: -40 °C to +60 °C (-40 °F to +140 °F)
Ceramics Lining: -15 °C to +60 °C (5 °F to +140 °F)

STANDARD PERFORMANCE

Reference Conditions:
Similar to BS EN 29104 (1993); ISO9104 (1991)
- Fluid temperature: +10 °C to +30 °C (+50 °F to +86 °F)
- Ambient temperature: +20 °C to +30 °C (+68 °F to +86 °F)
- Warm-up time: 30 min
- Straight runs:
  Upstream > 10 x DN
  Downstream > 5 x DN
- Properly grounded
- Properly centered

Accuracy (at reference conditions)

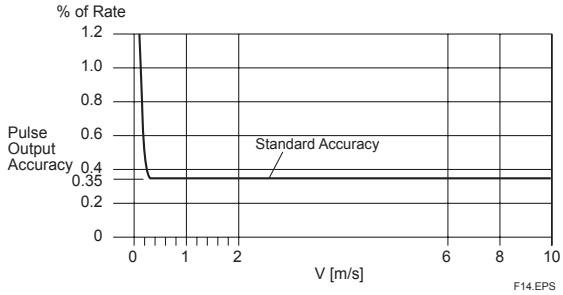
Pulse Output Accuracy:

PFA/Ceramics Lining:

Size mm (in)	Flow Velocity V m/s (ft/s)	Standard Accuracy (Calibration code B)	Flow Velocity V m/s (ft/s)	High Grade Accuracy (Calibration
2.5 (0.1) to 15 (0.5)	$V < 0.3$ (1)	±1.0 mm/s	—	
	$0.3 \le V \le 10$ (1) (33)	±0.35 % of Rate		
25 (1.0) to 200 (8.0)	$V < 0.15$ (0.5)	±0.5 mm/s	$V < 0.15$ (0.5)	±0.5 mm/s
	$0.15 \le V \le 10$ (0.5) (33)	±035 % of Rate	$0.15 \le V < 1$ (0.5) (3.3)	±0.18 % of Rate ± 0.2 mm/s
			$1 \le V \le 10$ (3.3) (33)	±0.2 % of Rate
250 (10) to 400 (16)	$V < 0.15$ (0.5)	±0.5 mm/s	—	
	$0.15 \le V \le 10$ (0.5) (33)	±0.35 % of Rate		

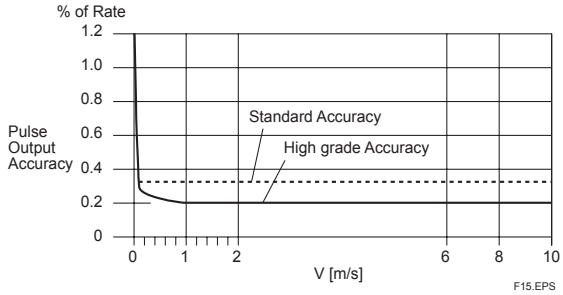
T08.EPS

Size 2.5 mm (0.1 in) to 15 mm (0.5 in)



F14.EPS

Size 25 mm (1.0 in) to 400 mm (16 in)



F15.EPS

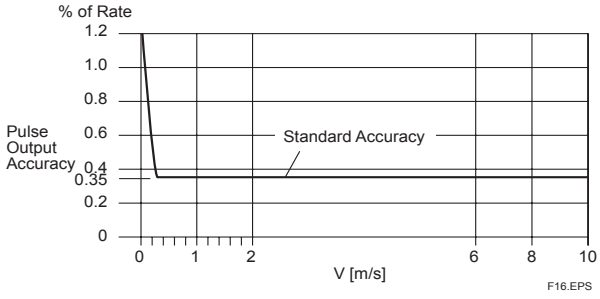
Pulse Output Accuracy:

Polyurethane Rubber / Natural Soft Rubber / EPDM Rubber Lining:

Size mm (in.)	Flow Velocity V m/s (ft/s)	Standard Accuracy (Calibr. code B)
25 (1.0) to 400 (16)	V < 0.3 (1.0)	±1.0 mm/s
	0.3 ≤ V ≤ 10 (1.0) (33)	±0.35% of Rate

T09.EPS

Size 25 mm (1.0 in) to 400 mm (16 in)



F16.EPS

Pulse Output Accuracy:

Enhanced dual frequency excitation (Option code /HF2):

Standard accuracy + 1 mm/s

Current Output Accuracy: "⊗"

Pulse output accuracy plus 0.05 % of Span

Repeatability:

± 0.1 % of Rate (V ≥ 1 m/s (3.3 ft/s))

± 0.05 % of Rate ± 0.5 mm/s (V < 1 m/s (3.3 ft/s))

Maximum Power Consumption:

Integral Flowmeter: 12 W

Remote Flowtube: Combined with AXFA11: 20 W

Combined with AXFA14: 12 W

Insulation Resistance (Performance Requirements) (*1 see next page)**:**

Integral Flowmeter :

100 MΩ between power terminals and ground terminal at 500 V DC

100 MΩ between power terminals and each output/status input terminal at 500 V DC

20 MΩ between ground terminal and each output/status input terminal at 100 V DC

20 MΩ between output/status input terminals at 100 V DC

Remote Flowtube:

100 MΩ between excitation terminals and each signal terminal at 500 V DC

100 MΩ between signal terminals at 500 V DC

Withstand Voltage (Performance):

Integral Flowmeter

Between power supply terminals and ground terminal: 1390 V AC for 2 s

Between power supply terminals and input/output terminals: 1390 V AC for 2 s

Remote Flowtube (option code KF2, CF1, and SF2)

Between excitation current terminal and ground terminal: 1500 V AC for 1 minute

Between signal terminals and ground terminal 1500 V AC for 1 minute

Between signal terminals and excitation current terminal: 2000V AC for 1 minute

Remote Flowtube (option code FF1)

Between signal terminals and ground terminal: 500 V AC for 1 minute or 600 V AC for 1 s

Between signal terminals and excitation current terminal: 2000 V AC for 1 minute or 2400 V AC for 1s

⚠ CAUTION

- Before performing the Insulation Resistance Test or the Withstand Voltage Test please obey the following cautions:
- Disconnect the ground terminal if the power terminal has a lightning protector (optional code A).
- Following the relevant test, wait for more than 10 s after the power supply has been turned off before removing the cover.
- After testing, be sure to use a resistor for discharge and return the short bar to its correct position.
- Screws must be tightened to a torque of 1.18 Nm or more.
- After closing the cover, the power supply can be restored.

Safety Requirement Standards:

EN 61010-1

- Altitude at installation site: Max. 2000 m above sea level
- Installation category based on IEC 1010: Overvoltage category II ("II" applies to electrical equipment which is supplied from the fixed installation like distribution board.)
- Pollution degree based on IEC 1010 Pollution degree 2 ("Pollution degree" describes the degree to which a solid, liquid, or gas which deteriorates dielectric strength or surface resistivity is adhering. "2" applies to a normal indoor atmosphere.)

EMC Conformity Standards:

EN 61326

EN 61000-3-2, EN 61000-3-3

AS/NZS CISPR11

Pressure Equipment Directive (PED):

Module: H
Type of Equipment: Piping
Type of Fluid: Liquid and Gas
Group of Fluid: 1 and 2

General-Purpose Use / Submersible Style / Explosion proof Style:

MODEL	DN (mm) (*1)	PS (MPa) (*1)	PS DN (MPa · mm)	CATEGORY(*2)
AXF002G/C	2.5	4	10	Article 3, (*3) paragraph 3
AXF005G/C	5	4	20	Article 3, (*3) paragraph 3
AXF010G/C	10	4	40	Article 3, (*3) paragraph 3
AXF015G/W/C	15	4	60	Article 3, (*3) paragraph 3
AXF025G/W/C	25	4	100	Article 3, (*3) paragraph 3
AXF032G/W/C	32	4	128	II
AXF040G/W/C	40	4	160	II
AXF050G/W/C	50	4	200	II
AXF065G/W/C	65	2	130	II
AXF080G/W/C	80	2	160	II
AXF100G/W/C	100	2	200	II
AXF125G/W/C	125	2	250	II
AXF150G/W/C	150	2	300	II
AXF200G/W/C	200	2	400	III
AXF250G/W/C	250	2	500	III
AXF300G/W/C	300	2	600	III
AXF350G/W/C	350	1	700	II
AXF400G/W/C	400	1	800	III

T10-1.EPS

Sanitary Style:

MODEL	DN (mm) (*1)	PS (bar) (*1)	PS DN (bar · mm)	CATEGORY (*2)
AXF015H	15	10	150	Article 3, (*3) paragraph 3
AXF025H	25	10	250	Article 3, (*3) paragraph 3
AXF032H	32	10	320	I
AXF040H	40	10	400	I
AXF050H	50	10	500	I
AXF065H	65	10	650	I
AXF080H	80	10	800	I
AXF100H	100	10	1000	I
AXF125H	125	10	1250	II

T10-2.EPS

*1: PS: Maximum allowable pressure for Flowtube
DN: Nominal size

*2: For details, see "Table 6 covered by ANNEX II of EC Directive on Pressure Equipment Directive 97/23/EC."

*3: AXF002G to AXF025G/W, AXF015H and AXF025H are outside the scope of PED's CE marking.

NORMAL OPERATING CONDITIONS

Ambient Temperature: -40 °C to 60°C (-40 °F to 140 °F)

- Minimum temperature should also be limited according to minimum fluid temperature of linings.
- Indicator's operating range (integral flowmeter) : -20 °C to 60 °C (-5 °F to 140 °F)
- Maximum temperature should be 50 °C (122 °F) in the case of Power supply code 2 (integral flowmeter).

Ambient Humidity: 0 to 100 %

Lengthy continuous operation at 95 % or more is not recommended.

Power Supply (integral type):

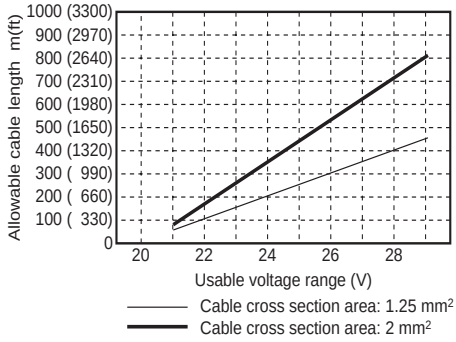
Power supply suffix code 1:

- AC specifications
  Rated power supply: 100 to 240 V AC, 50/60 Hz
  (Operating voltage range: 80 to 264 V AC)
- DC specifications
  Rated power supply: 100 to 120 V DC
  (Operating voltage range: 90 to 130 V DC)

Power supply suffix code 2:

- AC specifications
  Rated power supply: 24 V AC, 50/60 Hz
  (Operating voltage range: 20.4 to 28.8 V AC)
- DC specifications
  Rated power supply: 24 V DC
  (Operating voltage range: 20.4 to 28.8 V DC)

Supplied Power and Cable Length for Power Supply Code 2



F01.EPS

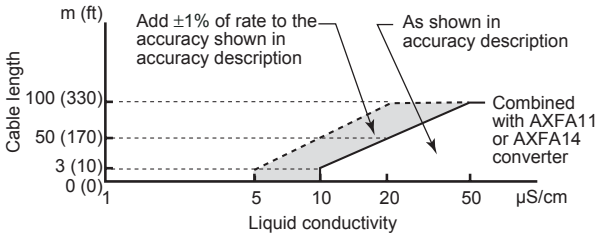
Fluid Conductivity:

Size 2.5 to 10 mm (0.1 to 0.4 in): 5 µS/cm or larger
Size 15 to 125 mm (0.5 to 5 in): 1 µS/cm or larger
Size 150 to 400 mm (6 to 16 in): 3 µS/cm or larger

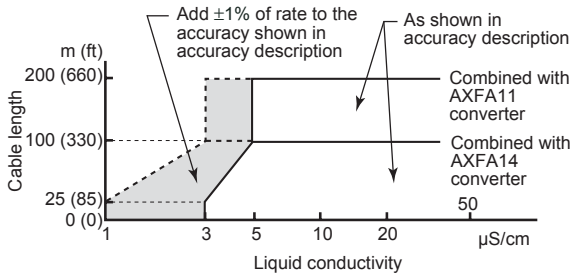
Note: In the case of fluids which have large flow noise (pure water, pure alcohol or others), low conductivity or low viscosity, please contact Yokogawa office for application support.

Cable Length and Liquid Conductivity (Remote Flowtube):

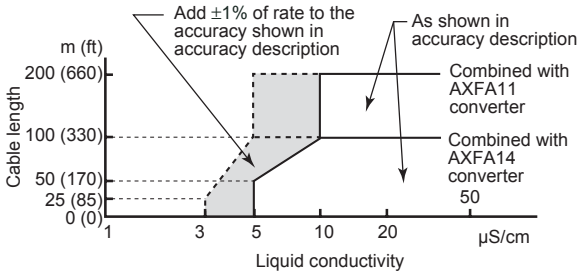
Size 2.5 to 10 mm (0.1 to 0.4 in)



Size 15 to 125 mm (0.5 to 5.0 in)



Size 150 to 400 mm (6.0 to 16 in)



F03.EPS

Note: In case that size 250 or 300 mm (10 or 12 in) is used for high conductivity fluid (e.g. caustic soda, seawater), please use the flange type.

Measurable Flow rate Range:

SI Units (Size: mm, Flow rate: m³/h)

Size (mm)	0 to Min. Span Flow Rate (0.1 m/s)	0 to Max. Span Flow Rate (10 m/s)
2.5	0 to 0.0018 m³/h	0 to 0.1767 m³/h
5	0 to 0.0071	0 to 0.7068
10	0 to 0.0283	0 to 2.8274
15	0 to 0.0637	0 to 6.361
25	0 to 0.1768	0 to 17.671
32	0 to 0.2897	0 to 28.967
40	0 to 0.4524	0 to 45.23
50	0 to 0.7069	0 to 70.68
65	0 to 1.1946	0 to 119.45
80	0 to 1.8096	0 to 180.95
100	0 to 2.8275	0 to 282.74
125	0 to 4.418	0 to 441.7
150	0 to 6.362	0 to 636.1
200	0 to 11.310	0 to 1130.9
250	0 to 17.672	0 to 1767.1
300	0 to 25.447	0 to 2544.6
350	0 to 34.64	0 to 3463
400	0 to 45.24	0 to 4523

T11.EPS

English Units (Size: in, Flow rate: GPM)

Size (in.)	0 to Min. Span Flow Rate (0.33 ft/s)	0 to Max. Span Flow Rate (33ft/s)
0.1	0 to 0.0081 GPM	0 to 0.8031 GPM
0.2	0 to 0.0322	0 to 3.212
0.4	0 to 0.1286	0 to 12.850
0.5	0 to 0.2008	0 to 20.078
1.0	0 to 0.8032	0 to 80.31
1.25	0 to 1.004	0 to 100.39
1.5	0 to 1.8071	0 to 180.70
2.0	0 to 3.213	0 to 321.2
2.5	0 to 5.020	0 to 501.9
3.0	0 to 7.229	0 to 722.8
4.0	0 to 12.851	0 to 1285.0
5.0	0 to 20.079	0 to 2007.8
6.0	0 to 28.914	0 to 2891.3
8.0	0 to 51.41	0 to 5140
10	0 to 80.32	0 to 8031
12	0 to 115.66	0 to 11565
14	0 to 157.42	0 to 15741
16	0 to 205.61	0 to 20560

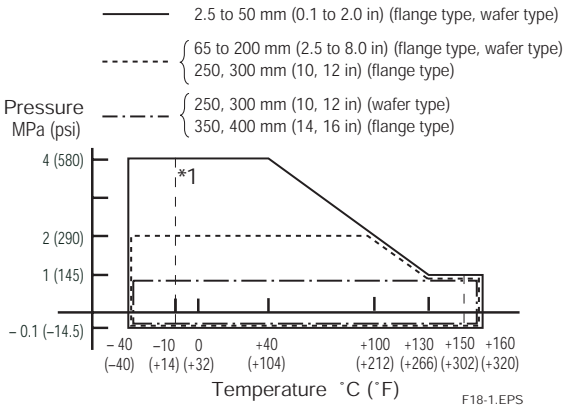
T24.EPS

Fluid Temperature and Pressure:

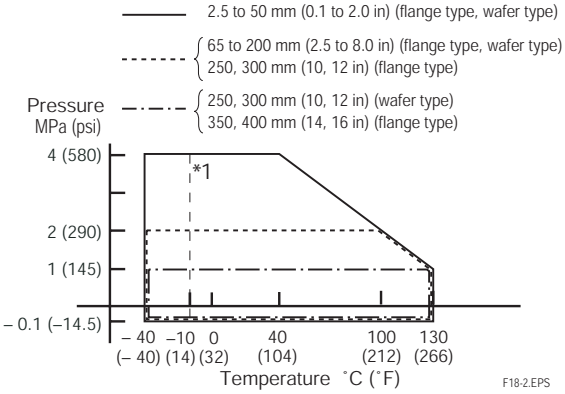
The following figures show maximum allowable fluid pressure for the flowtube itself. Further fluid pressure should also be limited according to the flange rating. For fluid temperature of the explosion proof type, refer to descriptions of "HAZARDOUS AREA CLASSIFICATION".

PFA Lining (*1)

General-Purpose Use and Submersible style, Explosion proof style, Remote Flowtube (Electrode structure code 1: Non-replaceable electrode)

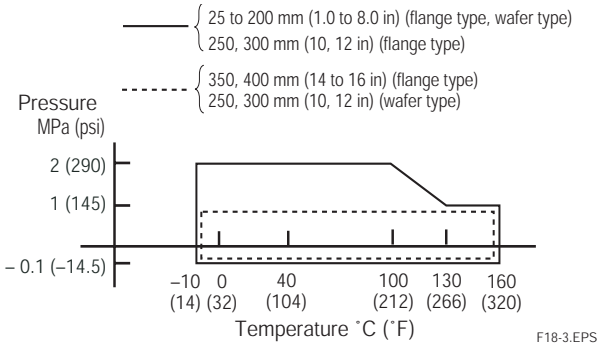


General-Purpose Use, Integral flowmeter and Explosion proof style (Electrode structure code 1: Non-replaceable electrode)

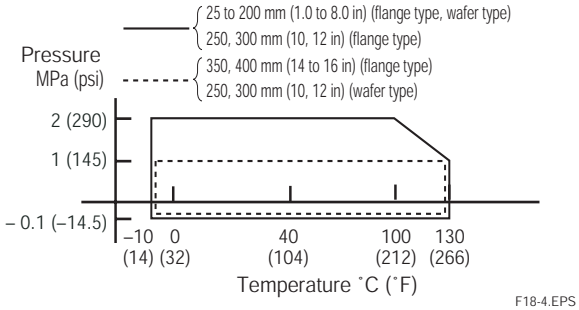

2.5 to 50 mm (0.1 to 2.0 in) (flange type, wafer type)
65 to 200 mm (2.5 to 8.0 in) (flange type, wafer type)
250, 300 mm (10, 12 in) (flange type)
250, 300 mm (10, 12 in) (wafer type)
350, 400 mm (14, 16 in) (flange type)
Pressure MPa (psi)
4 (580)
2 (290)
1 (145)
– 0.1 (–14.5)
*1
– 40 (– 40)
–10 (14)
0 (32)
40 (104)
100 (212)
130 (266)
Temperature ˚C (˚F)
F18-2.EPS

*1: For lay length code 2 in wafer types of 25 mm (1.0 in), and for wafer types of 32 mm to 300 mm(1.25 to 12 in), and for carbon steel flange types (process connection code: C**) of 50 to 400 mm (2.0 to 16 in) the minimum temperature is -10 °C (+14 °F).

General-Purpose Use, Remote Flowtube (Electrode structure code 2: replaceable electrode)

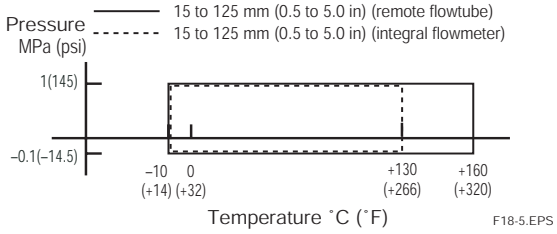


General-Purpose Use, Integral Flowmeter (Electrode structure code 2: replaceable electrode)


25 to 200 mm (1.0 to 8.0 in) (flange type, wafer type)
250, 300 mm (10, 12 in) (flange type)
350, 400 mm (14 to 16 in) (flange type)
250, 300 mm (10, 12 in) (wafer type)
Pressure MPa (psi)
2 (290)
1 (145)
– 0.1 (–14.5)
–10 (14)
0 (32)
40 (104)
100 (212)
130 (266)
Temperature ˚C (˚F)
F18-4.EPS

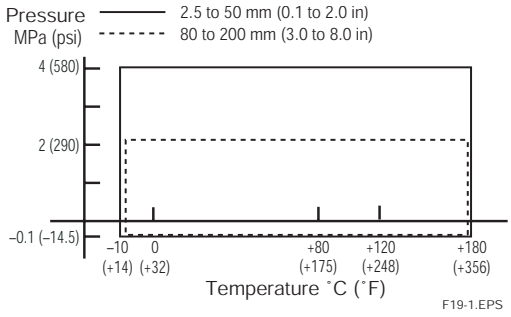
Note: For replaceable electrodes for fluid temperatures of 10 °C or less, please contact your Yokogawa office.

Sanitary style (Electrode structure code 1: Non-replaceable electrode)

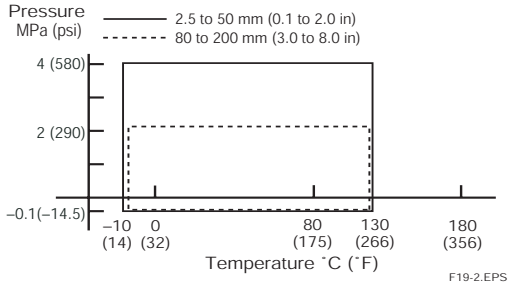


Ceramics Lining

General-Purpose Use and Explosion proof style, Remote Flowtube (Electrode structure code 1: Non-replaceable electrode)



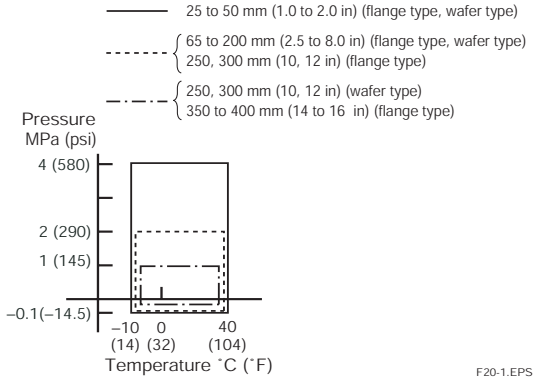
General-Purpose Use and Explosion proof Style, Integral flowmeter (Electrode structure code 1: Non-replaceable electrode)



F19-2.EPS

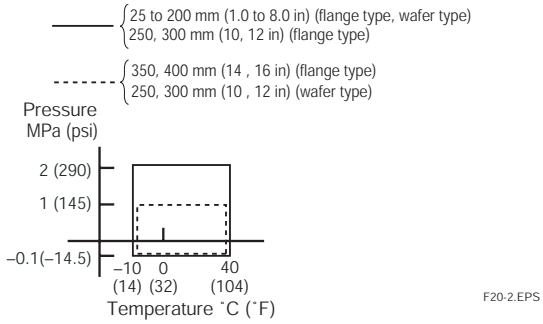
Polyurethane Lining

General-Purpose Use and Submersible style, Remote Flowtube (Electrode structure code 1: Non-replaceable electrode)


25 to 50 mm (1.0 to 2.0 in) (flange type, wafer type)
65 to 200 mm (2.5 to 8.0 in) (flange type, wafer type)
250, 300 mm (10, 12 in) (flange type)
250, 300 mm (10, 12 in) (wafer type)
350 to 400 mm (14 to 16 in) (flange type)
Pressure
MPa (psi)
4 (580)
2 (290)
1 (145)
–0.1(–14.5)
–10 (14)
0 (32)
40 (104)
Temperature ˚C (˚F)

F20-1.EPS

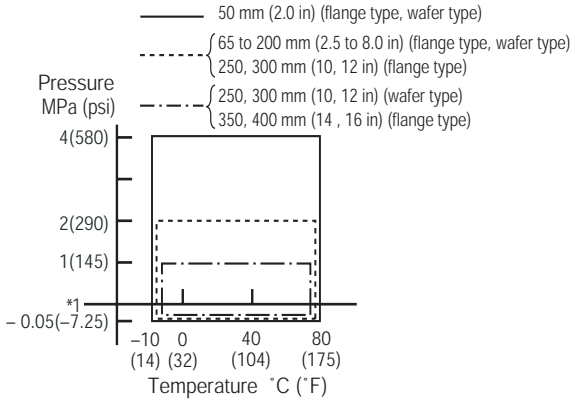
General-Purpose Use, Integral flowmeter (Electrode structure code 2: replaceable electrode)


25 to 200 mm (1.0 to 8.0 in) (flange type, wafer type)
250, 300 mm (10, 12 in) (flange type)
350, 400 mm (14 , 16 in) (flange type)
250, 300 mm (10 , 12 in) (wafer type)
Pressure
MPa (psi)
2 (290)
1 (145)
–0.1(–14.5)
–10 (14)
0 (32)
40 (104)
Temperature ˚C (˚F)

F20-2.EPS

Natural Soft Rubber Lining

General-Purpose Use and Submersible Style, Remote Flowtube (Electrode structure code 1 : Non-replaceable electrode)

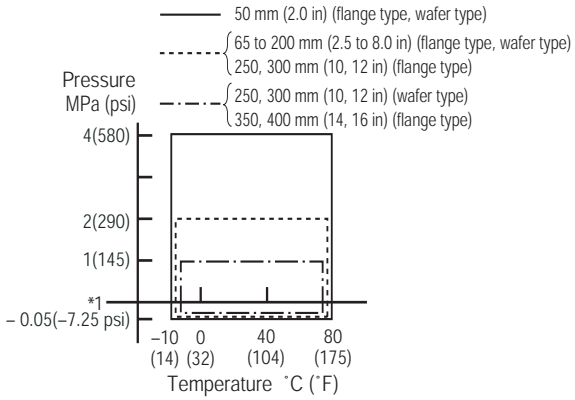


*1 : –0.04 MPa (–5.7 psi) for sizes of 350 mm (14 in.) and 400 mm (16 in.)

F05-2.EPS

EPDM Rubber Lining

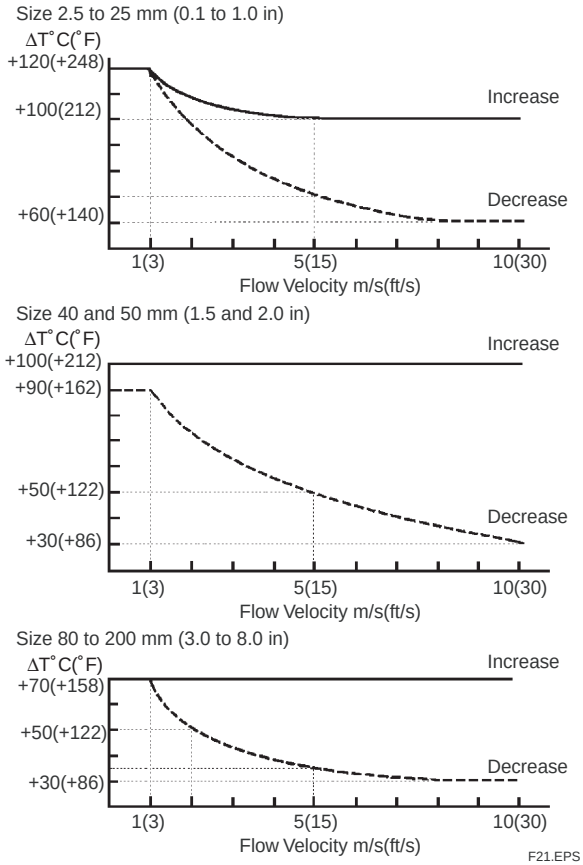
General-Purpose Use and Submersible Style, Remote Flowtube (Electrode structure code 1 : Non-replaceable electrode)



*1 : –0.04 MPa (–5.7 psi) for sizes of 350 mm (14 in) and 400 mm (16 in)

F05-3.EPS

Reasonable Figure for Thermal Shock of Ceramics Lining:



"Decrease" means that the temperature of a measured fluid drops rapidly, while "increase" means that the temperature rises rapidly. The maximum allowable ranges in both cases are indicated by the curves shown in the diagrams, with the solid line indicating the maximum increase, and the broken line the maximum decrease.

ΔT: Change in temperature of measured fluid per second

Flow velocity: flow velocity of the measured fluid

Allowable Conditions for Cleaning of Sanitary Style Linings:

Steam or hot water for cleaning: Max. temp.= 150 °C (302 °F), time = 60 min or less

Vibration Conditions:

Level of vibration in conformity with IEC 60068-2-6 (SAMA 31.1-1980)

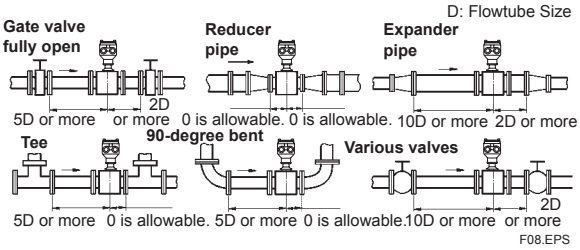
- Integral flowmeter: 1 G or less (frequency 500 Hz or less)
- Remote Flowtube (size 2.5 to 400 mm (0.1 to 16 in)): 2 G or less (frequency 500 Hz or less)

Note: Avoid locations with much vibration (where the pipe vibration frequency is 500 Hz or more), which may cause damage to the equipment.

CAUTIONS FOR INSTALLATION

Mounting of Flowmeters and Required Lengths of Straight Runs

(See JIS B7554 "Electromagnetic flowmeters. ")



Required straight runs

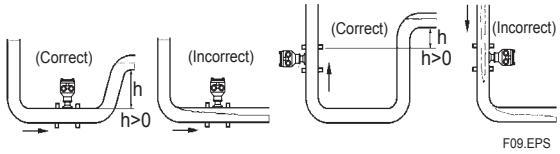
- Do not install anything in the vicinity that may interfere with the magnetic field, induced signal voltages, or flow velocity distributions of the flowmeter.
- A straight run may not be required on the downstream side of the flowmeter. However, if a downstream valve or other fitting causes irregularity deviation in flows, provide a straight run of 2D to 3D on the downstream side.
- Highly recommend to mount valves on the downstream side so that deviated flows do not occur in the flowtube and to avoid startup from an empty condition.

Maintaining Stable Fluid Conductivity

Do not install the flowmeter where fluid conductivity tends to become uneven. If chemicals are fed near the upstream side of an electromagnetic flowmeter, they may affect the flowmeter's indications. To avoid this situation, it is recommended that the chemical feed ports be located on the downstream side of the flowmeter. If it is unavoidable that chemicals must be fed on the upstream side, provide a sufficient length of straight run (approximately 50D) to ensure the proper mixture of fluids.

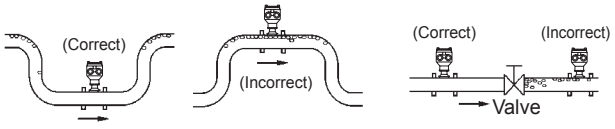
Piping Configuration

- Pipes must be fully filled with liquids. It is essential that pipes remain filled at all times, or flow rate indications may be affected and measurement errors may be caused.
- Pipes shall be designed so as to maintain the flowtube always filled with fluids.
- Vertical mounting is effective in cases where fluids tend to separate or solid matter may be precipitated. When employing vertical mounting, direct the fluids from the bottom to the top to ensure that pipes remain fully filled.



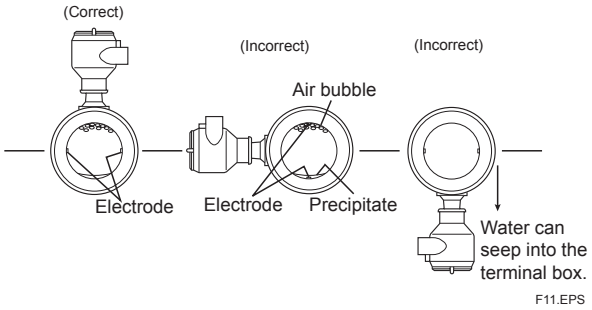
Mounting Positions

- Avoid Air Bubbles:
  - If air bubbles enter a measurement pipe, flow rate indications may be affected and measurement errors may be caused.
  - In cases where fluids contain air bubbles, piping must be designed to prevent them from accumulating in the measurement pipe of a flowtube.
  - If a valve exists near the flowtube, try to mount the flowtube on the valves upstream side in order to prevent a possible reduction of pressure inside the pipe,thereby avoiding the possibility of air bubbles.



Avoiding of Air Bubbles

- Mounting Orientation:
  - If electrodes are perpendicular to the ground, air bubbles near the top or precipitates at the bottom may cause measurement errors.
  - Ensure that the terminal box of a remote flowtube and converter of an integral style are mounted above the piping to prevent water from entering them.



Mounting Orientation

ACCESSORIES

Remote Flowtube (size 2.5 to 1000 mm (0.1 to 40 in)):

Centering device (wafer type only): 1 pc.
Hexagonal wrench: 2 pcs.

Integral Flowmeter:

Centering device (wafer type only): 1 pc.
Time lag Fuse (T2.0A, 250 V): 1 pc.
Hexagonal wrench: 2 pcs.

INNER DIAMETER OF GROUNDING RING

Unit: mm (in)

	AXF Standard		Replacement Model for earlier ADMAG or ADMAG AE
Size	PFA /Polyurethane rubber	Ceramics	PFA /Polyurethane rubber
2.5 (0.1)	15 (0.59)*1	—	15 (0.59)
5 (0.2)	15 (0.59)*1	—	15 (0.59)
10 (0.4)	15 (0.59)*1	—	15 (0.59)
15 (0.5)	15 (0.59)	15 (0.59)	15 (0.59)
25 (1.0)	28 (1.10)	27 (1.06)	27 (1.06)
32 (1.25)	34 (1.34)	—	—
40 (1.5)	41 (1.61)	40 (1.57)	40 (1.57)
50 (2.0)	53 (2.09)	52 (2.05)	52 (2.05)
65 (2.5)	66 (2.60)	—	—
80 (3.0)	77 (3.03)	81 (3.19)	81 (3.19)
100 (4.0)	102 (4.02)	98 (3.86)	98 (3.86)
125 (5.0)	128 (5.04)	—	—
150 (6.0)	146.1 (5.75)	144 (5.67)	140.7 (5.6)
200 (8.0)	193.6 (7.62)	192 (7.56)	188.9 (7.5)
250 (10)	Wafer: 243.7 (9.60) Flange: 243 (9.57)	—	239.1 (9.41)
300 (12)	Wafer: 294.7 (11.60) Flange: 291.3 (11.47)	—	—
350 (14)	Flange: 323.4 (12.73)	—	—
400 (16)	Flange: 373.5 (14.70)	—	—

T25.EPS

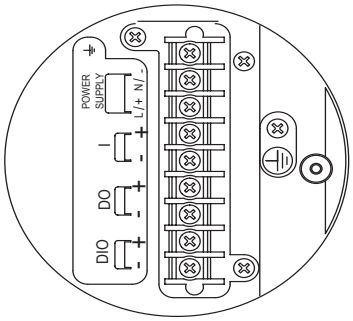
*1: The inner diameter I.D.of the process connection code: DD4 is 12 mm (0.47 in)

Note: Please ensure that the I.D. of the gasket does not protrude into the I.D. of the grounding ring and electrode. (This dimension is also applied to when no grounding ring is used).
If the I.D. of the gasket is too large, however, fluid leakage may result.

TERMINAL CONFIGURATION AND TERMINAL WIRING

Integral Flowmeter "⊗"

Terminal configuration



Terminal wiring

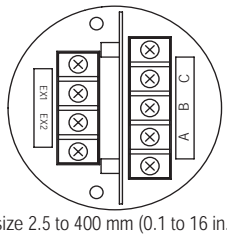
Terminal Symbols	Description
⏚	Functional grounding
N/- L/+	Power supply
I^+ I^-	Current output 4 to 20mA DC
DO^+ DO^-	Pulse output/Alarm output/ Status output
DIO^+ DIO^-	Alarm output/Status output Status input
⏚	Protective grounding (Outside of the terminal)

F41.EPS

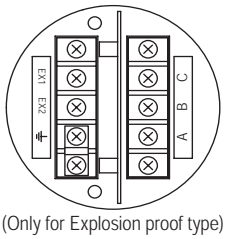
Remote Flowtube

Note : If submersible style ´W´ is selected, waterproof glands and a 30 m long cable are attached.

Terminal configuration



size 2.5 to 400 mm (0.1 to 16 in.)



(Only for Explosion proof type)

Terminal wiring

Terminal Symbols	Description
A B C	Flow signal output
EX1 EX2	Excitation current input
⏚	Functional grounding (Only for explosion proof type)
⏚	Protective grounding (Outside of the terminal)

F42.EPS

Recommended Excitation, Power and Output Cable:

Use polyvinyl chlorid insulated and shealted portable power cables.

- Outer diameter: 6.6 to 12 mm (0.26 to 0.47 in)
- Nominal Cross section: 0.5 to 2.5 mm²

Recommended electrode cable:

AXFC ....

See General Specifications (GS) of AXFA11 or AXFA14 for further details.

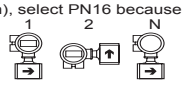
MODEL AND SUFFIX CODE

AXF STANDARD (Wafer Type)

General-purpose Use / Submersible Style / Explosion proof Style, PFA/Polyurethane Rubber / Natural Soft Rubber / EPDM Rubber Lining

Model	Suffix Code	Description	Applicable Model
AXF002	· · · · · · · · · · · · · · · · · · · ·	Size 2.5 mm (0.1 in) Integral Flowmeter/Remote Flowtube	
AXF005	· · · · · · · · · · · · · · · · · · · ·	Size 5 mm (0.2 in) Integral Flowmeter/Remote Flowtube	
AXF010	· · · · · · · · · · · · · · · · · · · ·	Size 10 mm (0.4 in) Integral Flowmeter/Remote Flowtube	
AXF015	· · · · · · · · · · · · · · · · · · · ·	Size 15 mm (0.5 in) Integral Flowmeter/Remote Flowtube	
AXF025	· · · · · · · · · · · · · · · · · · · ·	Size 25 mm (1.0 in) Integral Flowmeter/Remote Flowtube	
AXF032	· · · · · · · · · · · · · · · · · · · ·	Size 32 mm (1.25 in) Integral Flowmeter/Remote Flowtube	
AXF040	· · · · · · · · · · · · · · · · · · · ·	Size 40 mm (1.5 in) Integral Flowmeter/Remote Flowtube	
AXF050	· · · · · · · · · · · · · · · · · · · ·	Size 50 mm (2.0 in) Integral Flowmeter/Remote Flowtube	
AXF065	· · · · · · · · · · · · · · · · · · · ·	Size 65 mm (2.5 in) Integral Flowmeter/Remote Flowtube	
AXF080	· · · · · · · · · · · · · · · · · · · ·	Size 80 mm (3.0 in) Integral Flowmeter/Remote Flowtube	
AXF100	· · · · · · · · · · · · · · · · · · · ·	Size 100 mm (4.0 in) Integral Flowmeter/Remote Flowtube	
AXF125	· · · · · · · · · · · · · · · · · · · ·	Size 125 mm (5.0 in) Integral Flowmeter/Remote Flowtube	
AXF150	· · · · · · · · · · · · · · · · · · · ·	Size 150 mm (6.0 in) Integral Flowmeter/Remote Flowtube	
AXF200	· · · · · · · · · · · · · · · · · · · ·	Size 200 mm (8.0 in) Integral Flowmeter/Remote Flowtube	
AXF250	· · · · · · · · · · · · · · · · · · · ·	Size 250 mm (10 in) Integral Flowmeter/Remote Flowtube	
AXF300	· · · · · · · · · · · · · · · · · · · ·	Size 300 mm (12 in) Integral Flowmeter/Remote Flowtube	
Use	G · · · · · · · · · · · · · · · · · ·	General-Purpose Use	
	W · · · · · · · · · · · · · · · · · ·	Submersible style	Size 15 mm (0.5 in) to 300 mm (12 in) Remote Flowtube only. (*6)
	C · · · · · · · · · · · · · · · · · ·	Explosion proof style (*5) (*7) (*8)	Fluorocarbon PFA lining only
Converter Output Signal and Communication	-D · · · · · · · · · · · · · · · · ·	Integral Flowmeter with 4 to 20mA DC Output and BRAIN Communication	
	-E · · · · · · · · · · · · · · · · ·	Integral Flowmeter with 4 to 20 mA DC Output and HART Communication	
	-F · · · · · · · · · · · · · · · · ·	Integral Flowmeter with Digital communication (FOUNDATION Fieldbus protocol) (*9)	
	-N · · · · · · · · · · · · · · · · ·	Remote Flowtube for Combined use with AXFA11	
	-P · · · · · · · · · · · · · · · · ·	Remote Flowtube for Combined use with AXFA14	
	1 · · · · · · · · · · · · · · · · · ·	Integral Flowmeter, 100 V to 240 V AC or 100 to 120 V DC	
	2 · · · · · · · · · · · · · · · · · ·	Integral Flowmeter, 24V AC/DC	
	N · · · · · · · · · · · · · · · · · ·	Remote Flowtube	
Power Supply Lining (*6)	A · · · · · · · · · · · · · · · · · ·	Fluorocarbon PFA	
	U · · · · · · · · · · · · · · · · · ·	Polyurethane Rubber	Size 25 mm (1.0 in) to 300 mm (12 in)
	D · · · · · · · · · · · · · · · · · ·	Natural Soft Rubber	Size 50 mm (2.0 in) to 300 mm (12 in)
	G · · · · · · · · · · · · · · · · · ·	EPDM Rubber	Size 50 mm (2.0 in) to 300 mm (12 in)
Electrode Material (*6)	L · · · · · · · · · · · · · · · · · ·	JIS SUS316L (AISI 316L SS/EN 1.4404 Equivalent)	Fluorocarbon PFA lining only
	P · · · · · · · · · · · · · · · · · ·	Platinum-iridium	
	H · · · · · · · · · · · · · · · · · ·	Hastelloy C276 Equivalent	Fluorocarbon PFA lining only
	T · · · · · · · · · · · · · · · · · ·	Tantalum	
	V · · · · · · · · · · · · · · · · · ·	Titanium	
	W · · · · · · · · · · · · · · · · · ·	Tungsten Carbide	
Electrode Structure	1 · · · · · · · · · · · · · · · · · ·	Non-replaceable	General-Purpose use, Size 25 mm (1.0 in) to 300 mm (12 in) Electrode Material: JIS SUS316L only
	2 · · · · · · · · · · · · · · · · · ·	Replaceable	
Grounding Ring and Grounding Electrode Material (*6)	N · · · · · · · · · · · · · · · · · ·	None	
	L · · · · · · · · · · · · · · · · · ·	JIS SUS316L (AISI 316L SS/EN 1.4404 Equivalent)	
	P · · · · · · · · · · · · · · · · · ·	Platinum-iridium	Size 2.5 mm (0.1 in) to 200 mm (8.0 in) Fluorocarbon PFA lining only
	H · · · · · · · · · · · · · · · · · ·	Hastelloy C276 Equivalent	
	T · · · · · · · · · · · · · · · · · ·	Tantalum	Size 2.5 mm (0.1 in) to 200 mm (8.0 in), Fluorocarbon PFA lining only
	V · · · · · · · · · · · · · · · · · ·	Titanium	
Process Connection (*3)	-AA1 · · · · · · · · · · · · · · · ·	ANSI Class 150 Wafer (*1)	Size 2.5 mm (0.1 in) to 300 mm (12 in)
	-AA2 · · · · · · · · · · · · · · · ·	ANSI Class 300 Wafer (*1)	Size 2.5 mm (0.1 in) to 200 mm (8 in)
	-AD1 · · · · · · · · · · · · · · · ·	DIN PN 10 Wafer (*2)	Size 200 mm (8 in) to 300 mm (12 in)
	-AD2 · · · · · · · · · · · · · · · ·	DIN PN 16 Wafer (*2)	Size 65 mm (2.5 in) to 300 mm (12 in)
	-AD4 · · · · · · · · · · · · · · · ·	DIN PN 40 Wafer (*1)(*2)	Size 2.5 mm (0.1in) to 50 mm (2.0 in)
Lay Length	1 · · · · · · · · · · · · · · · · · ·	Standard	
Electrical Connection (Wiring port thread) (*8)	-0	JIS G1/2 female	mandatory for W-style not available for G- and C-style
	-2 · · · · · · · · · · · · · · · · · ·	ANSI 1/2 NPT female	
	-4 · · · · · · · · · · · · · · · · · ·	ISO M20x1.5 female	
Indicator (*4)	1 · · · · · · · · · · · · · · · · · ·	Integral Flowmeter with indicator (Horizontal)	
	2 · · · · · · · · · · · · · · · · · ·	Integral Flowmeter with indicator (Vertical)	
	N · · · · · · · · · · · · · · · · · ·	Integral Flowmeter without indicator /Remote Flowtube	
Calibration	B · · · · · · · · · · · · · · · · · ·	Standard (accuracy 0.35% of rate)	
	C · · · · · · · · · · · · · · · · · ·	High Grade (accuracy 0.2% of rate)	Size 25 mm (1.0 in) to 200 mm (8.0 in), Fluorocarbon PFA lining only
	/ ■	Optional code (See the Table of Optional Specifications)	

*1: For a wafer style of 2.5 to 10 mm (0.1 to 0.4 in), prepare 15 mm (0.5 in) diameter nominal flanges on the process pipe side.
(Process connection codes: AA1, AA2, AD4)
*2: Even when DIN PN10 or 16 is required for a model of size 2.5 to 50 mm (0.1 to 2.0 in), select PN40 because there is no difference in the dimensions of the mating faces. (Process connection codes:AD1, AD2 and AD4)
Even when DIN PN10 is required for a model of size 65 to 150 mm (2.5 to 6.0 in), select PN16 because there is no difference in the dimensions of the mating faces. (Process connection codes: AD1, AD2)
*3: Mating dimensions are based on standards as follow:
ANSI: ASME B 16.5, DIN: DIN 2501
*4: N shall be always selected for remote flowtubes
In the case of an integral flowmeter, select from among the figures at the right



*5: For explosion proof types specify type of explosion proof certification using the optional code
*6: The use of inappropriate materials can result the leakage of corrosive process fluids and cause injury to personal and / or damage to plant facilities.
It is also possible that the instrument itself can be damaged and that fragments from the instrument can contaminate the user´s process fluid.
Be very careful with highly corrosive process fluids such as hydrochloric acid, sulfuric acid, hydrogen sulfide,sodium hydrochlorite and high temperature steam (150 °C (300 °F) or above). Contact Yokogawa for detailed information of the wetted parts material.
*7: Provided with 30 m of cable. If different cable length is required please order option code /L*** in increments of 5m (e.g. L005, L010...)
*8: ANSI 1/2NPT and ISO M20x1.5 electrical connections are available for ATEX, FM or CSA explosion proof style
*9: For FOUNDATION Fieldbus protocol, refer to GS 01E20F02-01E.

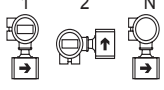
T15.EPS

AXF STANDARD (Wafer/Union Joint Type)

General-purpose Use / Explosion proof Style, Ceramics Lining

Model	Suffix Code	Description	Applicable Model
AXF002	·····	Size 2.5 mm (0.1 in) Integral Flowmeter/Remote Flowtube	
AXF005	·····	Size 5 mm (0.2 in) Integral Flowmeter/Remote Flowtube	
AXF010	·····	Size 10 mm (0.4 in) Integral Flowmeter/Remote Flowtube	
AXF015	·····	Size 15 mm (0.5 in) Integral Flowmeter/Remote Flowtube	
AXF025	·····	Size 25 mm (1.0 in) Integral Flowmeter/Remote Flowtube	
AXF040	·····	Size 40 mm (1.5 in) Integral Flowmeter/Remote Flowtube	
AXF050	·····	Size 50 mm (2.0 in) Integral Flowmeter/Remote Flowtube	
AXF080	·····	Size 80 mm (3.0 in) Integral Flowmeter/Remote Flowtube	
AXF100	·····	Size 100 mm (4.0 in) Integral Flowmeter/Remote Flowtube	
AXF150	·····	Size 150 mm (6.0 in) Integral Flowmeter/Remote Flowtube	
AXF200	·····	Size 200 mm (8.0 in) Integral Flowmeter/Remote Flowtube	
Use	G ·····	General-Purpose Use	
	C ·····	Explosion proof style (*5)	
Converter Output Signal and Communication	-D ·····	Integral Flowmeter with 4 to 20 mA DC Output and BRAIN Communication	
	-E ·····	Integral Flowmeter with 4 to 20 mA DC Output and HART Communication	
	-F ·····	Integral Flowmeter with Digital communication (FOUNDATION Fieldbus protocol) (*7)	
	-N ·····	Remote Flowtube for Combined use with AXFA11	
	-P ·····	Remote Flowtube for Combined use with AXFA14	
Power Supply	1 ·····	Integral Flowmeter, 100 V to 240 V AC or 100 to 120 V DC	
	2 ·····	Integral Flowmeter, 24 V AC/DC	
	N ·····	Remote Flowtube	
Lining (*6)	C ·····	Ceramics	
Electrode Material (*6)	E ·····	Platinum-alumina Cermet	
Electrode Structure	1 ·····	Non-replaceable	
Grounding Ring and Grounding Electrode Material (*6)	N ·····	None	Size 2.5 mm (0.1 in) to 200 mm (8.0 in)
	L ·····	JIS SUS316L (AISI 316L SS/EN 1.4404 Equivalent)	Size 15 mm (0.5 in) to 200 mm (8.0 in)
	P ·····	Platinum-Iridium	Size 15 mm (0.5 in) to 200 mm (8.0 in)
	H ·····	Hastelloy C276 Equivalent	Size 15 mm (0.5 in) to 200 mm (8.0 in)
	T ·····	Tantalum	Size 15 mm (0.5 in) to 200 mm (8.0 in)
	V ·····	Titanium	Size 15 mm (0.5 in) to 200 mm (8.0 in)
Process Connection (*2)	-AA1·····	ANSI Class 150 Wafer	Size 15 mm (0.5 in) to 200 mm (8.0 in)
	-AA2·····	ANSI Class 300 Wafer	Size 15 mm (0.5 in) to 200 mm (8.0 in)
	-AD1·····	DIN PN 10 Wafer (*1)	Size 200 mm (8.0 in) only
	-AD2·····	DIN PN 16 Wafer (*1)	Size 80 mm (3.0 in) to 200 mm (8.0 in)
	-AD4·····	DIN PN 40 Wafer (*1)	Size 15 mm (0.5 in) to 50 mm (2.0 in)
	-GUW·····	Union Joint (Weld Joint)	Size 2.5 mm (0.1 in) to 10 mm (0.4 in)
	-GUN·····	Union Joint (1/4NPT male for 2.5 or 5 mm dia.: 3/8NPT male for 10 mm dia.)	Size 2.5 mm (0.1 in) to 10 mm (0.4 in)
	-GUR·····	Union Joint (R1/4 male for 2.5 or 5 mm dia.: R3/8 male for 10 mm dia.)	Size 2.5 mm (0.1 in) to 10 mm (0.4 in)
Lay Length (*3)	1·····	Standard	
Electrical Connection (wiring port thread)	-2 ····	ANSI 1/2 NPT female	
	-4 ····	ISO M20x1.5 female	
Indicator (*4)	1 ···	Integral Flowmeter with indicator (horizontal)	
	2 ···	Integral Flowmeter with indicator (vertical)	
	N ···	Integral Flowmeter without indicator /Remote Flowtube	
Calibration	B ···	Standard (accuracy 0.35 % of rate)	
	C ···	High Grade (accuracy 0.2 % of rate)	Size 25 mm (1.0 in.) to 200 mm (8.0 in)
	/■	Optional code (See the Table of Optional Specifications)	

*1: For a wafer style of 2.5 to 10 mm (0.1 to 0.4 in), prepare 15 mm (0.5 in) diameter nominal flanges on the process pipe side.
(Process connection codes: AA1, AA2, AD4, AJ1, and AJ2)
*2: Even when DIN PN10 or 16 is required for a model of size 2.5 to 50 mm (0.1 to 2.0 in), select PN40 because there is no difference in the dimensions of the mating faces. (Process connection codes: AD1, AD2 and AD4)
Even when DIN PN10 is required for a model of size 65 to 150 mm (2.5 to 6.0 in), select PN16 because there is no difference in the dimensions of the mating faces. (Process connection codes: AD1, AD2)
*3: Mating dimensions are based on standards as follow:
ANSI: ASME B 16.5, DIN: DIN 2501
*4: N shall be always selected for remote flowtubes.
In the case of an integral flowmeter, select from among the figures at the right.



*5: For explosion proof types specify type of explosion proof certification using the optional code
*6: The use of inappropriate materials can result the leakage of corrosive process fluids and cause injury to personal and/or damage to plant facilities.
It is also possible that the instrument itself can be damaged and that fragments from the instrument can contaminate the user´s process fluid.
Be very careful with highly corrosive process fluids such as hydrochloric acid, sulfuric acid, hydrogen sulfide, sodium hydrochlorite and high temperature steam (150 °C (300 °F) or above). Contact Yokogawa for detailed information of the wetted parts material.
*7: For FOUNDATION Fieldbus protocol, refer to GS 01E20F02-01E.

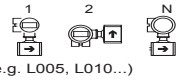
T16.EPS

AXF STANDARD (Flange Type) Size 2.5 to 400 mm (0.1 to 16 in)

General-purpose Use / Submersible Style / Explosion proof Style, PFA / Polyurethane Rubber / Natural Soft Rubber / EPDM Rubber Lining

Model	Suffix Code	Description	Applicable Model
AXF002		Size 2.5 mm (0.1 in) Integral Flowmeter/Remote Flowtube	
AXF005		Size 5 mm (0.2 in) Integral Flowmeter/Remote Flowtube	
AXF010		Size 10 mm (0.4 in) Integral Flowmeter/Remote Flowtube	
AXF015		Size 15 mm (0.5 in) Integral Flowmeter/Remote Flowtube	
AXF025		Size 25 mm (1.0 in) Integral Flowmeter/Remote Flowtube	
AXF032		Size 32 mm (1.25 in) Integral Flowmeter/Remote Flowtube	
AXF040		Size 40 mm (1.5 in) Integral Flowmeter/Remote Flowtube	
AXF050		Size 50 mm (2.0 in) Integral Flowmeter/Remote Flowtube	
AXF065		Size 65 mm (2.5 in) Integral Flowmeter/Remote Flowtube	
AXF080		Size 80 mm (3.0 in) Integral Flowmeter/Remote Flowtube	
AXF100		Size 100 mm (4.0 in) Integral Flowmeter/Remote Flowtube	
AXF125		Size 125 mm (5.0 in) Integral Flowmeter/Remote Flowtube	
AXF150		Size 150 mm (6.0 in) Integral Flowmeter/Remote Flowtube	
AXF200		Size 200 mm (8.0 in) Integral Flowmeter/Remote Flowtube	
AXF250		Size 250 mm (10 in) Integral Flowmeter/Remote Flowtube	
AXF300		Size 300 mm (12 in) Integral Flowmeter/Remote Flowtube	
AXF350		Size 350 mm (14 in) Integral Flowmeter/Remote Flowtube	
AXF400		Size 400 mm (16 in) Integral Flowmeter/Remote Flowtube	
Use	G	General-Purpose Use	
	W	Submersible style (*7)	Size 15 mm (0.5 in) to 400 mm (16 in), Remote Flowtube only.
	C	Explosion proof style (*6) (*8)	Fluorocarbon PFA lining only
Converter Output Signal and Communication	-D	Integral Flowmeter with 4 to 20 mA DC Output and BRAIN Communication	
	-E	Integral Flowmeter with 4 to 20 mA DC Output and HART Communication	
	-F	Integral Flowmeter with Digital communication (FOUNDATION Fieldbus protocol) (*10)	
	-N	Remote Flowtube for Combined use with AXFA11	
	-P	Remote Flowtube for Combined use with AXFA14	
Power Supply	1	Integral Flowmeter, 100 V to 240 V AC or 100 to 120 V DC	
	2	Integral Flowmeter, 24 V AC/DC	
	N	Remote Flowtube	
Lining (*9)	A	Fluorocarbon PFA	
	U	Polyurethane Rubber	Size 25 mm (1.0 in) to 400 mm (16 in)
	D	Natural Soft Rubber	Size 50 mm (2.0 in) to 400 mm (16 in)
	G	EPDM Rubber	Size 50 mm (2.0 in) to 400 mm (16 in)
Electrode Material (*9)	L	JIS SUS316L (AISI 316L SS/EN 1.4404 Equivalent)	
	P	Platinum-Iridium	Fluorocarbon PFA lining only
	H	Hastelloy C276 Equivalent	
	T	Tantalum	Fluorocarbon PFA lining only
	V	Titanium	
	W	Tungsten Carbide	
Electrode Structure	1	Non-replaceable	
	2	Replaceable	General-Purpose use, Size 25 mm (1.0 in) to 400 mm (16 in) Electrode Material: JIS SUS316L only
Grounding Ring and Grounding Electrode Material (*9)	N	None	
	L	JIS SUS316L (AISI 316L SS/EN 1.4404 Equivalent)	
	P	Platinum-iridium	Size 2.5 mm (0.1 in) to 200 mm (8.0 in), Fluorocarbon PFA lining only
	H	Hastelloy C276 Equivalent	
	T	Tantalum	Size 2.5mm (0.1 in) to 200 mm (8.0 in), Fluorocarbon PFA lining only
	V	Titanium	
Process Connection (*4)	-BA1	ANSI Class 150 Flange (Stainless Steel)(*1)	Size 2.5 mm (0.1 in) to 400 mm (16 in)
	-BA2	ANSI Class 300 Flange (Stainless Steel)(*1)	Size 2.5 mm (0.1 in) to 300 mm (12 in)
	-BD1	DIN PN 10 Flange (Stainless Steel)(*2)	Size 200 mm (8.0 in) to 400 mm (16 in)
	-BD2	DIN PN 16 Flange (Stainless Steel)(*2)	Size 65 mm (2.5 in) to 300 mm (12 in)
	-BD4	DIN PN 40 Flange (Stainless Steel)(*1)(*2)	Size 2.5 mm (0.1 in) to 50 mm (2.0 in)
	-CA1	ANSI Class 150 Flange (Carbon Steel)	Size 50 mm (2 in) to 400 mm (16 in)
	-CA2	ANSI Class 300 Flange (Carbon Steel)	Size 50 mm (2 in) to 300 mm (12 in)
	-CD1	DIN PN 10 Flange (Carbon Steel)(*2)	Size 200 mm (8.0 in) to 400 mm (16 in)
	-CD2	DIN PN 16 Flange (Carbon Steel)(*2)	Size 65 mm (2.5 in) to 300 mm (12 in)
	-CD4	DIN PN 40 Flange (Carbon Steel)(*2)	Size 50 mm (2.0 in) only
	-DD4	DIN PN 40 Flange (Stainless Steel), DN10(*2)(*3)	Size 2.5 mm (0.1 in) to 10 mm (0.4 in)
Lay Length	1	Standard	
Electrical Connection (wiring port thread) (*6)	-0	JIS G1/2 female	mandatory for W-style not available for G- and C-style
	-2	ANSI 1/2 NPT female	
	-4	ISO M20x1.5 female	
Indicator (*5)	1	Integral Flowmeter with indicator (horizontal)	
	2	Integral Flowmeter with indicator (vertical)	
	N	Integral Flowmeter without indicator /Remote Flowtube	
Calibration	B	Standard (accuracy 0.35 % of rate)	
	C	High Grade (accuracy 0.2 % of rate)	Size 25 mm (1.0 in) to 200 mm (8.0 in), Fluorocarbon PFA lining only
	/ ■	Optional code (See the Table of Optional Specifications)	

*1: For a flange style of 2.5 to 10 mm (0.1 to 0.4 in), prepare 15 mm (0.5 in) diameter nominal flanges on the process pipe side. (Process connection codes: BA1, BA2, BD4, BJ1, and BJ2).
*2: Even when DIN PN10 or 16 is required for a model of size 2.5 to 50 mm (0.1 to 2.0 in.), select PN40 because there is no difference in the dimensions of the mating faces. (Process connection codes: BD1, BD2, BD4, CD1, CD2, CD4 and DD4)
Even when DIN PN10 is required for a model of size 65 to 150 mm (2.5 to 6.0 in), select PN16 because there is no difference in the dimensions of the mating faces. (Process connection codes: BD1, BD2, CD1 and CD2)
*3: For a flange type of 2.5 to 10 mm (0.1 to 0.4 in), prepare 10 mm (0.4 in) diameter nominal flanges on the process pipe side. (Process connection codes: DJ1, DJ2, and DD4).
*4: Mating dimensions are based on standards as follow: ANSI: ASME B 16.5, DIN: DIN 2501, JIS: JIS2220
*5: N shall be always selected for remote flowtubes.
In the case of an integral flowmeter, select from among the figures at the right:



*6: ANSI 1/2NPT and ISO M20x1.5 electrical connections are available for ATEX, FM or CSA explosion proof style
*7: Provided with 30 m of cable. if different cable length is required please order option code /L*** in increments of 5 m (e.g. L005, L010...)
*8: For explosion proof types specify type of explosion proof certification using the optional code
*9: The use of inappropriate materials can result the leakage of corrosive process fluids and cause injury to personal and/or damage to plant facilities.
It is also possible that the instrument itself can be damaged and that fragments from the instrument can contaminate the user´s process fluid.
Be very careful with highly corrosive process fluids such as hydrochloric acid, sulfuric acid, hydrogen sulfide, sodium hydrochlorite and high temperature steam (150 °C (300 °F) or above). Contact Yokogawa for detailed information of the wetted parts material.
*10: For FOUNDATION Fieldbus protocol, refer to GS 01E20F02-01E.

T17.EPS

AXF STANDARD (Clamp/Union/Butt Weld Connection)
Sanitary Style, PFA Lining

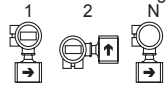
Model	Suffix Code	Description	Applicable Model
AXF015	·····	Size 15 mm (0.5 in), Integral Flowmeter/Remote Flowtube	
AXF025	·····	Size 25 mm (1.0 in), Integral Flowmeter/Remote Flowtube	
AXF032	·····	Size 32 mm (1.25 in), Integral Flowmeter/Remote Flowtube	
AXF040	·····	Size 40 mm (1.5 in), Integral Flowmeter/Remote Flowtube	
AXF050	·····	Size 50 mm (2.0 in), Integral Flowmeter/Remote Flowtube	
AXF065	·····	Size 65 mm (2.5 in), Integral Flowmeter/Remote Flowtube	
AXF080	·····	Size 80 mm (3.0 in), Integral Flowmeter/Remote Flowtube	
AXF100	·····	Size 100 mm (4.0 in), Integral Flowmeter/Remote Flowtube	
AXF125	·····	Size 125 mm (5.0 in), Integral Flowmeter/Remote Flowtube	
Use	H ·····	Sanitary Style	
Converter Output Signal and Communication	-D ·····	Integral Flowmeter with 4 to 20 mA DC Output and BRAIN Communication	
	-E ·····	Integral Flowmeter with 4 to 20 mA DC Output and HART Communication	
	-F ·····	Integral Flowmeter with Digital communication (FOUNDATION Fieldbus protocol) (*5)	
	-N ·····	Remote Flowtube for Combined use with AXFA11	
	-P ·····	Remote Flowtube for Combined use with AXFA14	
Power Supply	1 ·····	Integral Flowmeter, 100 V to 240 V AC or 100 to 120 V DC	
	2 ·····	Integral Flowmeter, 24 V AC/DC	
	N ·····	Remote Flowtube	
Lining (*4)	A ·····	Fluorocarbon PFA	
Electrode Material(*4)	L ·····	JIS SUS316L (AISI 316L SS/EN 1.4404 Equivalent)	
Electrode Structure	1·····	Non-replaceable	
Grounding Ring	N·····	None	
Process Connection (*2)	-HAB ·····	Tri-Clamp (3A), JIS SUS316L (AISI 316L SS/EN1.4404 Equivalent)(*1)	Size 15 mm (0.5 in) to 100 mm (4.0in), except 32 mm (1.25 in)
	-HDB ·····	DIN32676 Clamp, JIS SUS316L (AISI 316L SS/EN1.4404 Equivalent)	Size 15 mm (0.5 in) to 125 mm (5.0 in)
	-HKB ·····	ISO2852/SMS3016 Clamp, JIS SUS316L (AISI 316L SS/ EN1.4404 Equivalent)	Size 15 mm (0.5 in) to 125 mm (5.0 in)
	-JDB ·····	DIN11851 Union, SUS316L (AISI 316L SS/EN1.4404 Equivalent)	Size 15 mm (0.5 in) to 125 mm (5.0 in)
	-JKB ·····	ISO2853 Union, SUS316L (AISI 316L SS/EN1.4404 Equivalent)	Size 15 mm (0.5 in) to 100 mm (4.0 in)
	-JSB ·····	SMS1145 Union, SUS316L (AISI 316L SS/EN1.4404 Equivalent)	Size 25 mm (1.0 in) to 100 mm (4.0 in)
	-KDB ·····	Butt Weld for DIN 11850 Pipe Connection (SUS316L [AISI 316L SS/EN1.4404 Equivalent])	Size 15 mm (0.5 in) to 125 mm (5.0 in)
	-KKB ·····	Butt Weld for ISO 2037 Pipe Connection (SUS316L [AISI 316L SS/EN1.4404 Equivalent])	Size 15 mm (0.5 in) to 125 mm (5.0 in)
Lay Length	1 ·····	Standard	
Electrical Connection (wiring port thread)	-2 ····	ANSI 1/2 NPT female	
	-4 ····	ISO M20x1.5 female	
Indicator (*3)	1 ···	Integral Flowmeter with indicator (Horizontal)	
	2 ···	Integral Flowmeter with indicator (Vertical)	
	N ···	Integral Flowmeter without indicator /Remote Flowtube	
Calibration	B ···	Standard (accuracy 0.35 % of rate)	
	C ···	High Grade (accuracy 0.2 % of rate)	Size 25 mm (1.0 in) to 125 mm (5.0 in)
	/■	Optional code (See the Table of Optional Specifications)	

T18.EPS

*1: For a tri-clamp type of size15 mm (0.5 in), prepare a 3/4 in. tri-clamp on the process pipe side. (Process connection code: HAB).

*2: The detailed dimensions of process connections (clamp/union/butt weld) are shown in the 'EXTERNAL DIMENSIONS' section of the sanitary style.
In case of Butt Weld Type ferrules, the sleeves or alternative must be provided by the user. User needs to weld these parts to the butt weld adapter.
Gasket between process connection PFA-liner: Standard EPDM (Tmax = 150 °C / CIP capable)
Option /GH: Silicine rubber (Tmax = 160 °C / CIP capable)

*3: N shall be always selected for remote flowtubes.
In the case of an integral flowmeter, select from among the following figures.



*4: The use of inappropriate materials can result the leakage of corrosive process fluids and cause injury to personal and/or damage to plant facilities.
It is also possible that the instrument itself can be damaged and that fragments from the instrument can contaminate the user´s process fluid.
Be very careful with highly corrosive process fluids such as hydrochloric acid, sulfuric acid, hydrogen sulfide, sodium hydrochlorite and high temperature steam (150 °C (300 °F) or above). Contact Yokogawa for detailed information of the wetted parts material.

*5: For FOUNDATION Fieldbus protocol, refer to GS 01E20F02-01E.

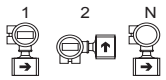
REPLACEMENT MODEL FOR EARLIER ADMAG OR ADMAG AE (WAFER TYPE)

General-purpose Use / Submersible Style / Explosion proof Style, PFA / Polyurethane Rubber Lining
For the Wafer Types of size 250 mm (10 in), 300 mm (12 in), AXF Standard shall be selected.

Model	Suffix Code	Description	Applicable Model
AXF002	·····	Size 2.5 mm (0.1 in) Integral Flowmeter/Remote Flowtube	
AXF005	·····	Size 5 mm (0.2 in) Integral Flowmeter/Remote Flowtube	
AXF010	·····	Size 10 mm (0.4 in) Integral Flowmeter/Remote Flowtube	
AXF015	·····	Size 15 mm (0.5 in) Integral Flowmeter/Remote Flowtube	
AXF025	·····	Size 25 mm (1.0 in) Integral Flowmeter/Remote Flowtube	
AXF040	·····	Size 40 mm (1.5 in) Integral Flowmeter/Remote Flowtube	
AXF050	·····	Size 50 mm (2.0 in) Integral Flowmeter/Remote Flowtube	
AXF080	·····	Size 80 mm (3.0 in) Integral Flowmeter/Remote Flowtube	
AXF100	·····	Size 100 mm (4.0 in) Integral Flowmeter/Remote Flowtube	
AXF150	·····	Size 150 mm (6.0 in) Integral Flowmeter/Remote Flowtube	
AXF200	·····	Size 200 mm (8.0 in) Integral Flowmeter/Remote Flowtube	
Use	G ·····	General-Purpose Use	
	W ·····	Submersible style (*7)	Size 15 mm (0.5 in) to 200 mm (8.0 in), Remote Flowtube only. (*7)
	C ·····	Explosion proof style (*6) (*8)	Fluorocarbon PFA lining only
Converter Output Signal and Communication	-D ·····	Integral Flowmeter with 4 to 20 mA DC Output and BRAIN Communication	
	-E ·····	Integral Flowmeter with 4 to 20 mA DC Output and HART Communication	
	-F ·····	Integral Flowmeter with Digital communication (FOUNDATION Fieldbus protocol) (*10)	
	-N ·····	Remote Flowtube for Combined use with AXFA11	
	-P ·····	Remote Flowtube for Combined use with AXFA14	
Power Supply	1 ·····	Integral Flowmeter, 100 V to 240 V AC or 100 to 120 V DC	
	2 ·····	Integral Flowmeter, 24 V AC/DC	
	N ·····	Remote Flowtube	
Lining (*9)	A ·····	Fluorocarbon PFA	
	U ·····	Polyurethane Rubber	Size 25 mm (1.0 in) to 200 mm (8.0 in)
Electrode Material (*9)	L ·····	JIS SUS316L (AISI 316L SS/EN 1.4404 Equivalent)	
	P ·····	Platinum-iridium	Fluorocarbon PFA lining only
	H ·····	Hastelloy C276 Equivalent	
	T ·····	Tantalum	Fluorocarbon PFA lining only
	V ·····	Titanium	
	W ·····	Tungsten Carbide	
Electrode Structure	1 ·····	Non-replaceable	
Grounding Ring and Grounding Electrode Material (*9)	N ·····	None	Size 25 mm (1.0 in) to 200 mm (8.0 in) (*5)
	L ·····	JIS SUS316L (AISI 316L SS/EN 1.4404 Equivalent)	
	P ·····	Platinum-iridium	Fluorocarbon PFA lining only
	H ·····	Hastelloy C276 Equivalent	
	T ·····	Tantalum	Fluorocarbon PFA lining only
	V ·····	Titanium	
Process Connection (*3)	-AA1 ·····	ANSI Class 150 Wafer(*1)	Size 2.5 mm (0.1 in) to 200 mm (8.0 in)
	-AA2 ·····	ANSI Class 300 Wafer(*1)	Size 2.5 mm (0.1 in) to 200 mm (8.0 in)
	-AD1 ·····	DIN PN 10 Wafer(*2)	Size 200 mm(8.0 in) only
	-AD2 ·····	DIN PN 16 Wafer(*2)	Size 80 mm (3.0 in) to 200 mm (8.0 in)
	-AD4 ·····	DIN PN 40 Wafer(*1)(*2)	Size 2.5 mm (0.1 in) to 50 mm (2.0 in)
Lay Length	2 ·····	Matches an Earlier ADMAG Flowmeter (ADMAG or ADMAG AE) for Replacement	
Electrical Connection (wiring port thread)	-0	JIS G1/2 female	must for W-style, not for G- or C-Style
	-2 ····	ANSI 1/2 NPT female	
	-4	ISO M20x1.5 female	
Indicator (*4)	1 ···	Integral Flowmeter with indicator (horizontal)	
	2 ···	Integral Flowmeter with indicator (vertical)	
	N ···	Integral Flowmeter without indicator / Remote Flowtube	
Calibration	B ···	Standard	
	/ ■	Optional code (See the Table of Optional Specifications)	

T19.EPS

*1: For a flange style of 2.5 to 10 mm (0.1 to 0.4 in), prepare 15 mm (0.5 in) diameter nominal flanges on the process pipe side. (Process connection codes: AA1, AA2, AD4, AJ1 and AJ2)
*2: Even when DIN PN10 or 16 is required for a model of size 2.5 to 50 mm (0.1 to 2.0 in), select PN40 because there is no difference in the dimensions of the mating faces. (Process connection code: AD4)
Even when DIN PN10 is required for a model of size 80 to 150 mm (3.0 to 6.0 in), select PN16 because there is no difference in the dimensions of the mating faces. (Process connection codes: AD1, AD2).
*3: Mating dimensions are based on standards as follow:
ANSI: ASME B 16.5, DIN: DIN 2501
*4: N shall be always selected for remote flowtubes.
In the case of an integral type, select from among the figures at the right:



*5: For a wafer style of size 2.5 mm (0.1 in.) to 10 mm (0.4 in.) without a grounding ring, the AXF standard shall be selected because it has the same lay length.
*6: ANSI 1/2NPT and ISO M20x1.5 electrical connections are available for ATEX, FM or CSA explosion proof style
*7: Provided with 30 m of cable. If different cable length is required please order option code /L*** in increments of 5 m (e.g. L005, L010...)
*8: For explosion proof types specify type of explosion proof certification using the optional code
*9: The use of inappropriate materials can result the leakage of corrosive process fluids and cause injury to personal and/or damage to plant facilities.
It is also possible that the instrument itself can be damaged and that fragments from the instrument can contaminate the user´s process fluid.
Be very careful with highly corrosive process fluids such as hydrochloric acid, sulfuric acid, hydrogen sulfide, sodium hydrochlorite and high temperature steam (150°C (300°F) or above). Contact Yokogawa for detailed information of the wetted parts material
*10: For FOUNDATION Fieldbus protocol, refer to GS 01E20F02-01E..

REPLACEMENT MODEL FOR EARLIER ADMAG OR ADMAG AE (Flange Type)

General-purpose Use / Submersible Style / Explosion proof Style, PFA / Polyurethane Rubber Lining
For Flange Types of size 15 mm (0.5 in) to 100 mm (4.0 in), 300 mm (12 in) to 2600 mm (104 in), AXF Standard shall be selected.

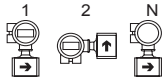
Model	Suffix Code	Description	Applicable Model
AXF150	· · · · · · · · · · · · · · · · · · ·	Size 150 mm (6.0 in) Integral Flowmeter/Remote Flowtube	
AXF200	· · · · · · · · · · · · · · · · · · ·	Size 200 mm (8.0 in) Integral Flowmeter/Remote Flowtube	
AXF250	· · · · · · · · · · · · · · · · · · ·	Size 250 mm (10 in) Integral Flowmeter/Remote Flowtube	
Use	G · · · · · · · · · · · · · · · · · ·	General-Purpose Use	
	W · · · · · · · · · · · · · · · · · ·	Submersible style (*5)	Remote Flowtube only.
	C	Explosion proof style (*4) (*6)	Fluorocarbon PFA lining only
Converter Output Signal and Communication	-D · · · · · · · · · · · · · · · · ·	Integral Flowmeter with 4 to 20 mA DC Output and BRAIN Communication	
	-E · · · · · · · · · · · · · · · · ·	Integral Flowmeter with 4 to 20 mA DC Output and HART Communication	
	-F	Integral Flowmeter with Digital communication (FOUNDATION Fieldbus protocol) (*8)	
	-N · · · · · · · · · · · · · · · · ·	Remote Flowtube for Combined use with AXFA11	
	-P · · · · · · · · · · · · · · · · ·	Remote Flowtube for Combined use with AXFA14	
Power Supply	1 · · · · · · · · · · · · · · · · · ·	Integral Flowmeter, 100 V to 240 V AC or 100 to 120 V DC	
	2 · · · · · · · · · · · · · · · · · ·	Integral Flowmeter, 24 V AC/DC	
	N · · · · · · · · · · · · · · · · · ·	Remote Flowtube	
Lining (*7)	A · · · · · · · · · · · · · · · · · ·	Fluorocarbon PFA	
	U · · · · · · · · · · · · · · · · · ·	Polyurethane Rubber	
Electrode Material (*7)	L · · · · · · · · · · · · · · · · · ·	JIS SUS316L (AISI 316L SS/EN 1.4404 Equivalent)	
	P · · · · · · · · · · · · · · · · · ·	Platinum-iridium	Fluorocarbon PFA lining only
	H · · · · · · · · · · · · · · · · · ·	Hastelloy C276 Equivalent	
	T · · · · · · · · · · · · · · · · · ·	Tantalum	Fluorocarbon PFA lining only
	V · · · · · · · · · · · · · · · · · ·	Titanium	
	W · · · · · · · · · · · · · · · · · ·	Tungsten Carbide	
Electrode Structure	1 · · · · · · · · · · · · · · · · · ·	Non-replaceable	
	2 · · · · · · · · · · · · · · · · · ·	Replaceable	General-Purpose use,Electrode Material : JIS SUS316L only
Grounding Ring and Grounding Electrode Material (*7)	N · · · · · · · · · · · · · · · · · ·	None	
	L · · · · · · · · · · · · · · · · · ·	JIS SUS316L (AISI 316L SS/EN 1.4404 Equivalent)	
	P · · · · · · · · · · · · · · · · · ·	Platinum-iridium	Size150 mm (6.0 in), 200 mm (8.0 in), Fluorocarbon PFA lining only
	H · · · · · · · · · · · · · · · · · ·	Hastelloy C276 Equivalent	
	T · · · · · · · · · · · · · · · · · ·	Tantalum	Size150 mm (6.0 in), 200 mm (8.0 in), Fluorocarbon PFA lining only
	V · · · · · · · · · · · · · · · · · ·	Titanium	
Process Connection (*2)	-CA1 · · · · · · · ·	ANSI Class 150 Flange (Carbon Steel)	Size 150 mm (6.0 in) to 250 mm (10 in)
	-CA2 · · · · · · · ·	ANSI Class 300 Flange (Carbon Steel)	Size 150 mm (6.0 in) to 250 mm (10 in)
	-CD1 · · · · · · · ·	DIN PN 10 Flange (Carbon Steel)(*1)	Size 200 mm (8.0 in) to 250 mm (10 in)
	-CD2 · · · · · · · ·	DIN PN 16 Flange (Carbon Steel)(*1)	Size 150 mm (6.0 in.) to 250 mm (10 in)
	-CJ1 · · · · · · · ·	JIS 10K Flange (Carbon Steel)	Size 150 mm (6.0 in.) to 250 mm (10 in)
	-CJ2 · · · · · · · ·	JIS 20K Flange (Carbon Steel)	Size 150 mm (6.0 in.) to 250 mm (10 in)
	-CG1 · · · · · · · ·	JIS F12 (JIS75M) Flange (Carbon Steel)	Size 150 mm (6.0 in.) to 250 mm (10 in)
Lay Length	2 · · · · · · ·	Matches an Earlier ADMAG Flowmeter (ADMAG or ADMAG AE) for Replacement	
Electrical Connection (wiring port thread) (*4)	-0	JIS G 1/2 female	must for W-style,not for G- and C-style
	-2 · · · ·	ANSI 1/2 NPT female	
	-4 · · · ·	ISO M20x1.5 female	
Indicator (*3)	1 · · ·	Integral Flowmeter with indicator (Horizontal)	
	2 · · ·	Integral Flowmeter with indicator(Vertical)	
	N · · ·	Integral Flowmeter without indicator /Remote Flowtube	
Calibration	B · · ·	Standard	
	/ ■	Optional code (See the Table of Optional Specifications)	

T20.EPS

*1: Even when DIN PN10 is required for a 150 (6.0 in)-mm model, select PN16 because there is no difference in the dimensions of the mating faces. (Process connection codes: CD1, CD2)

*2: Mating dimensions are based on standards as follow:
ANSI: ASME B 16.5, DIN: DIN 2501, JIS: JIS2220

*3: N shall be always selected for remote flowtubes.
In the case of an integral flowmeter, select from among the following figures:



*4: ANSI 1/2NPT and ISO M20x1.5 electrical connections are available for ATEX, FM or CSA explosion proof style

*5: Provided with 30 m of cable. if different cable length is required please order option code /L*** in increments of 5 m (e.g. L005, L010...)

*6: For explosion proof types specify type of explosion proof certification using the optional code

*7: The use of inappropriate materials can result the leakage of corrosive process fluids and cause injury to personal and/or damage to plant facilities.
It is also possible that the instrument itself can be damaged and that fragments from the instrument can contaminate the user´s process fluid.
Be very careful with highly corrosive process fluids such as hydrochloric acid, sulfuric acid, hydrogen sulfide, sodium hydrochlorite and high temperature steam (150 °C (300 °F) or above). Contact Yokogawa for detailed information of the wetted parts material.

*8: For FOUNDATION Fieldbus protocol, refer to GS 01E20F02-01E.

OPTIONAL SPECIFICATIONS FOR FLOWTUBES

Table of optional specifications (size 2.5 to 400 mm (0.1 to 16 in.) "⊗"

●: Available –: Not available

Item	Specifications		Applicable Model								Code
			General		Explosion proof		Submersibl	Sanitary			
			Integral	Remote	Integral	Remote	Remote	Integral	Remote		
			AXF***G-D AXF***G-E	AXF***G-N AXF***G-P	AXF***C-D AXF***C-E	AXF***C-N AXF***C-P	AXF***W-N AXF***W-P	AXF***H-D AXF***H-E	AXF***H-N AXF***H-P		
Lightning Protector	A lightning protector is built into the power terminals.		●	–	●	–	–	●	–		A
DC Noise Cut Circuit	The DC Noise Cut Circuit is built in. Available for 15 mm (0.5 in) and larger sizes, and for fluids with the conductivity of 50 µS/cm or higher. Nullifies the empty check and electrode adhesion diagnostic function.		●	–	●	–	–	●	–		ELC
Burn Out Down	The output level is set to 0 mA during a CPU failure and is set 2.4 mA or less during an alarm. Standard products are delivered with a setting 25 mA during a CPU failure and 21.6 mA (110 %) or more during an alarm.		●	–	●	–	–	●	–		C1
NAMUR NE43 Compliant	Output signal limits: 3.8 to 20.5 mA	Failure alarm down-scale: Output status at a CPU failure is 0 mA or at alarm it is 2.4 mA (-10 %) or less.	●	–	●	–	–	●	–		C2
		Failure alarm up-scale. Output status at a CPU failure is 25 mA or at alarm it is 21.6 mA (110 %) or more.	●	–	●	–	–	●	–		C3
Active Pulse Output	Active pulses are output in order to drive an external electromagnetic or electronic counter directly using the converter's internal power supply. Nullifies the standard transistor contact pulse output. Output voltage: 24 V DC ±20 % Pulse specifications: • At the drive current of 30 to 150 mA Pulse rate: 0.0001 to 2 pps (pulse/second); Pulse width: 20, 33, 50, or 100 ms		●	–	●	–	–	●	–		EM
Mass Unit Setting	The flow rate span, transmission pulse weight, and totalizer display pulse weight can be set in terms of mass unit. Specify the density of the process fluid when ordering in addition to the mass flow rate span, transmission pulse weight (for mass unit),and totalizer display pulse weight (for mass unit). When ordering a remote flowtube, parameters for 'Mass Unit Setting' will be set in the corresponding converter before shipment. 1. Density a. Available density Numerics: Specify the numeric within the value of 0.0001 to 32000. And it can be up to five digits, to a maximum of 32000 ignoring the decimal point. A fraction is limited to the fourth decimal place. b. Available density units: kg/m^3, lb/gal, lb/cf Example: A water density is about 1000kg/m^3. In this case specify "1000kg/m^3". However a density is changed by temperature. Specify the actual density. (The 1000kg/m^3 is equivalent to 8.345lb/gal and 62.43lb/cf.) 2. The mass flow rate span, transmission pulse weight, and totalizer display pulse weight a. Available density Numerics: Specify the numeric within the value of 0.0001 to 32000. And it can be up to five digits, to a maximum of 32000 ignoring the decimal point. A fraction is limited to the fourth decimal place. b. Mass Units Available mass units: t, kg, g, klb, lb Available time units: /d, /h, /min, /s Note1: In case of specifying the mass flow span, calculate the volumetric flow span by the setting density, and specify the available value in the mass flow span. Note2: In case of transmission pulse weight and totalizer display pulse weight, specify the mass unit which was specified as the flow unit.		●	●	●	●	●	●	●		MU
User-specified Signal and Exitacion Cable Length for SubmersibleType	The cable length is limited up to 200 m when combined with an AXFA11 converter, or 100 m when combined with an AXFA14 converter. Following "L" specify the cable length in 3 digits as a multiple of 5 m (i.e. 005, 010 or the like) If ordered without L*** standard length of 30 m is delivered		–	–	–	–	●	–	–		L***

T26-1.EPS

Table of optional specifications (size 2.5 to 400 mm (0.1 to 16 in) continued

● : Available –: Not available

Item	Specifications		Applicable Model							Code
			General		Explosion proof		Submersible	Sanitary		
			Integral	Remote	Integral	Remote	Remote	Integral	Remote	
			AXF***G-D AXF***G-E	AXF***G-N AXF***G-P	AXF***C-D AXF***C-E	AXF***C-N AXF***C-P	AXF***W-N AXF***W-P	AXF***H-D AXF***H-E	AXF***H-N AXF***H-P	
Mirror Finished PFA Lining	Mirror finishing on the PFA lining inside of the tube to the smoothness lying. Available for 15 mm (0.5 in) and larger sizes. The Ra is average of measured values on several point: Size 15 to 200 mm (0.5 to 8.0 in): Ra 0.05 to 0.15 µm Size 250 to 400 mm (10 to 16 in): Ra 0.05 to 0.25 µm		●	●	●	●	●	●	●	PM
Mirror Finished Ceramics	Mirror finishing on the inside of the ceramics tube to Rmax ≤ 1 µm. Available for 5 mm (0.2 in) and larger sizes.		●	●	●	●	–	–	–	CM
Stainless Steel Tag Plate	A pendant tag plate of JIS SUS304 (AISI 304 SS/EN 1.4301 equivalent) is provided. Choose this option when a pendant tag plate is required in addition to the standard nameplate with the tag number inscribed on it.		●	●	●	●	●	●	●	SCT
Direction change of the electrical connection (*1)	+90˚ rotated converter (or terminal box) to change the direction of the electrical connection. Available for 400 mm (16 in) or smaller sizes.		●	●	●	●	●	●	●	RA
	+180˚ rotated converter (or terminal box) to change the direction of the electrical connection. Available for 400 mm (16 in) or smaller sizes.		●	●	●	●	●	●	●	RB
	-90˚ rotated converter (or terminal box) to change the direction of the electrical connection. Available for 400 mm (16 in) or smaller sizes.		●	●	●	●	●	●	●	RC
Bolts, Nuts, and Gaskets (*2)	Bolts, nuts, and gaskets are provided for wafer connections. Available only for ANSI 150 connections.	Bolts: JIS SUS304 (AISI 304 SS stainless steel equivalent) Nuts: JIS SUS403 (AISI 403SS stainless steel equivalent) Gaskets: Chloroprene rubber	●	●	●	●	●	–	–	BSC
		Bolts: JIS SUS304 (AISI 304 SS stainless steel equivalent) Nuts: JIS SUS403 (AISI 403SS stainless steel equivalent) Gaskets: PTFE-sheathed non-asbestos	●	●	●	●	●	–	–	BSF
Special Gaskets (*3)	Viton® gaskets for use with a PFA or ceramics lining with PVC piping. Valqua #4010, special fluororubber not mixed. Available for 2.5 to 200 mm (0.1 to 8.0 in) of PFA lining or 15 to 200 mm (0.5 to 8 in) of ceramics lining.		●	●	●	●	●	–	–	GA
	Acid-resistant Viton® gaskets for use with a PFA or ceramics lining with PVC piping. Valqua #4010, special fluororubber mixed (mixing #RCD470). Available for 2.5 to 200 mm (0.1 to 8.0 in) of PFA lining or 15 to 200 mm (0.5 to 8 in) of ceramics lining.		●	●	●	●	●	–	–	GC
	Alkali-resistant Viton® gaskets for use with a PFA or ceramics lining with PVC piping. Valqua #4010, special fluororubber mixed (mixing #RCD970). Available for 2.5 to 200 mm (0.1 to 8.0 in) of PFA lining or 15 to 200 mm (0.5 to 8 in) of ceramics lining.		●	●	●	●	●	–	–	GD
	Alkali-resistant carbonized fluororesin gaskets for use with a ceramics lining tube with metal piping. Valqua #7026.		●	●	●	●	–	–	–	GF
	Silicon rubber gaskets for Sanitary Style, provided between the lining and the adapter. Available for the condition of fluid temp. over 120 ˚C (248 ˚F) to 160 ˚C (320 ˚F) max.		–	–	–	–	–	●	●	GH
Oil-prohibited Use	Electrodes, linings, and grounding rings are assembled and packed with polyethylene after being cleaned with water and acetone and dried with air. The label 'OIL FREE' is affixed.		●	●	●	●	–	–	–	K1
Oil-prohibited Use with Dehydrating Treatment	Electrodes, linings, and grounding rings are assembled and packed with polyethylene including desiccants after being cleaned with water and acetone and dried with air. The label 'OIL & WATER FREE' is affixed.		●	●	●	●	–	–	–	K5

T26-2.EPS

Table of optional specifications (size 2.5 to 400 mm (0.1 to 16 in) continued

● : Available –: Not available

Item	Specifications	Applicable Model							Code
		General		Explosion proof		Submersible	Sanitary		
		Integral	Remote	Integral	Remote	Remote	Integral	Remote	
		AXF***G-D AXF***G-E	AXF***G-N AXF***G-P	AXF***C-D AXF***C-E	AXF***C-N AXF***C-P	AXF***W-N AXF***W-P	AXF***H-D AXF***H-E	AXF***H-N AXF***H-P	
Epoxy Resin Coating	Epoxy resin coating with alkali-resistance instead of standard polyurethane resin coating. The color is the same as standard type.	●	●	●	●	–	–	–	X1
High Anti-corrosion Coating	Three-layer coating (polyurethane coating on two-layer epoxy resin coating) in the same range as that for the standard coating. The color is the same as standard type. Used for salt/alkali/acid/weather-resistance.	●	●	●	●	–	–	–	X2
Material Certificate	Reproduced material certificates for : PFA/polyurethane: Pipe, electrodes, grounding rings/grounding electrodes, mini flanges (for wafer style), flanges (for flange style), adapters (for sanitary type) Ceramics: only grounding rings or grounding electrodes	●	●	●	●	●	●	●	M01
Hydrostatic Test	The test verifies the absence of leaks by applying the following water pressures (which are determined under process connection conditions) to linings for ten minutes. Test results are described in the Note column of a test certificate (QIC). **Process Connection:** **Water Pressure:** ANSI Class 150, DIN PN10 1.5 MPa ANSI Class 300, DIN PN16, 3.0 MPa DIN PN40, Union joint, ceramics lining 6.0 MPa	●	●	●	●	●	–	–	T01
Calibration Certificate	Level 2: The Declaration and the Calibration Equipment List are issued.	●	●	●	●	●	●	●	L2
	Level 3: The Declaration and the Primary Standard List are issued.	●	●	●	●	●	●	●	L3
	Level 4: The Declaration and the Yokogawa Measuring Instruments Control System are issued.	●	●	●	●	●	●	●	L4
Vent Hole	With a vent hole provided for permeable fluids (such as nitric acid, hydrofluoric acid, or aqueous sodium hydroxide at high temperature). Available only for a PFA lining flange style tube.	●	●	●	●	–	–	–	H
Enhanced Dual Frequency Excitation (*4)	Available for 25 to 200 mm (1.0 to 8.0 in) sizes. Products are delivered with the Standard dual frequency excitation mode and the Enhanced dual frequency excitation mode enabled. The meter factor for the Enhanced dual frequency excitation obtained by flow calibration is inscribed on the nameplate and set into the combined converter in addition to the meter factor for the Standard dual frequency excitation.	●	●	●	●	●	●	●	HF2

T26-3.EPS

Table of optional specifications (size 2.5 to 400 mm (0.1 to 16 in) continued

● : Available –: Not available

Item	Specifications	Applicable Model							Code
		General		Explosion proof		Submersible	Sanitary		
		Integral	Remote	Integral	Remote	Remote	Integral	Remote	
		AXF**G-D AXF**G-E	AXF**G-N AXF**G-P	AXF**C-D AXF**C-E	AXF**C-N AXF**C-P	AXF**W-N AXF**W-P	AXF**H-D AXF**H-E	AXF**H-N AXF**H-P	
Five-point Calibration in User-specified Span	A flow test at 0, 25, 50, 75, and 100 % of the user-specified span is performed instead of the flow test of the standard 2 m/s span and a test certificate (QIC) is submitted. Specify the span (100 % flow span) whose corresponding flow velocity lies between 0.5 to 10 m/s and that is less than the maximum line capacity. Selectable range of flow rate span is shown below. **Size: mm (in) — Selectable range of flow rate span: m³/h (Flow rate span velocity: m/s)** 2.5 (0.1) 0.009 (0.5) to 0.05 (2.83) 5 (0.2) 0.036 (0.5) to 0.2 (2.83) 10 (0.4) 0.15 (0.5) to 0.96 (3.40) 15 (0.5) 0.32 (0.5) to 2.8 (4.40) 25 (1) 0.89 (0.5) to 11 (6.22) 32 (1.25) 1.45 (0.5) to 8.9 (10.00) 40 (1.5) 2.27 (0.5) to 32 (7.07) 50 (2) 3.54 (0.5) to 56 (7.92) 65 (2.5) 5.98 (0.5) to 80 (6.70) 80 (3) 9.05 (0.5) to 126 (6.96) 100 (4) 14.2 (0.5) to 220 (7.78) 125 (5) 22.1 (0.5) to 300 (6.79) 150 (6) 31.9 (0.5) to 380 (5.97) 200 (8) 56.6 (0.5) to 670 (5.92) 250 (10) 88.4 (0.5) to 1000 (5.66) 300 (12) 128 (0.5) to 1200 (4.72) 350 (14) 174 (0.5) to 1200 (3.47) 400 (16) 227 (0.5) to 1350 (2.98)	●	●	●	●	●	●	●	SC
FM Approval	Explosion proof See “HAZARDOUS AREA CLASSIFICATION”	–	–	●	●	–	–	–	FF1
CENELEC ATEX Certification (KEMA Approval)	Explosion proof See “HAZARDOUS AREA CLASSIFICATION”	–	–	●	●	–	–	–	KF2
CSA Certification	Explosion proof See “HAZARDOUS AREA CLASSIFICATION”	–	–	●	●	–	–	–	CF1
IECEx Certification (*5)	IECEx Explosion proof See “HAZARDOUS AREA CLASSIFICATION”	–	–	●	●	–	–	–	SF2

*1:

	Standard	+90° rotation Optional Code RA	+180° rotation Optional Code RB	-90° rotation Optional Code RC
Integral Flowmeter	Electrical Connection	Indicator	Electrical Connection	Indicator
Remote Flowtube		Electrical Connection		Electrical Connection

*2: When specifying the optional code BSC for a PFA or ceramics lining, it is advisable to specify the optional code GA, GC or GD at the same time to prevent potential leakage caused by the difference in elasticity between the flowtube and chloroprene gaskets.

*3: Special gaskets are inserted between the flowtube and the grounding ring or grounding electrode.

*4: Enhanced dual frequency excitation is not available for models with calibration code C (High Grade Accuracy).

*5: Applicable only for Australia and New Zealand area.

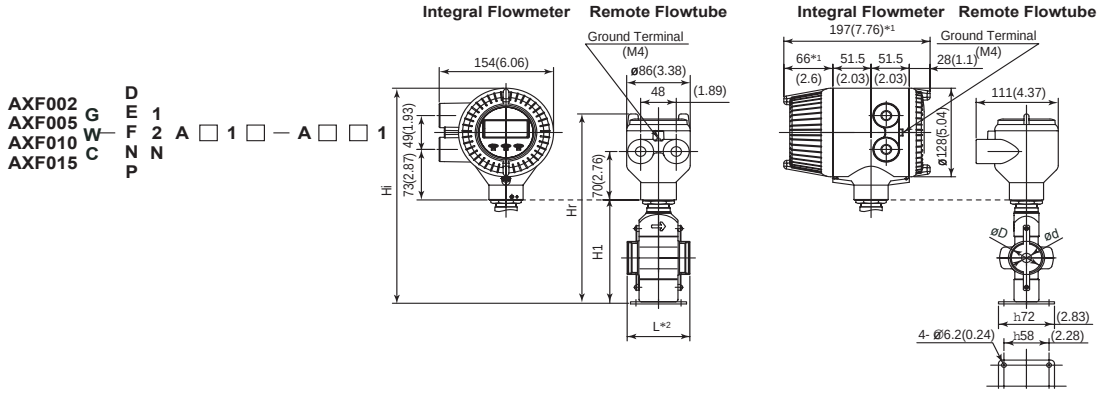
T26-4.EPS

EXTERNAL DIMENSIONS

AXF Standard, AXF002-AXF015, Wafer Type, PFA Lining

Unit: mm (approx. in)

AXF002
AXF005
AXF010
AXF015
G
W
C
— D E F N P 1 2 N A □ 1 □ — A □ □ 1



Model	Size code		002	005	010	015
	Size		2.5(0.1)	5(0.2)	10(0.4)	15(0.5)
	Lining code		A	A	A	A
Remote flowtube / Integral flowmeter	Face-to-face length	L $^{0}_{-3}$ *2	85 (3.35)			
	Outside dia.	ØD	42 (1.65)			
	Inner diameter of Grounding ring	Ød	15 (0.59)			
	Height	H1	144 (5.67)			
Remote flowtube	Max. Height	Hr	268 (10.55)			
	Weight kg (lb) *3		2.4 (5.3)			
Integral flowmeter	Max. Height	Hi	306 (12.03)			
	Weight kg (lb)		4.1 (9.0)			

*1: When indicator code N is selected, subtract 12 mm (0.47 in) from the value in the figure.
For explosion proof style with indicator add 5 mm (0.2 in) to it.

*2: Depending on the selection of grounding ring code and optional code, add the following value to L (face-to-face length).

F22.EPS

Grounding Ring Code		S, L, H, V	P, T	N
Option Code	None	+0	+26	-2 (0.08)
	GA, GC, GD (Special Gaskets)	+8 (0.31)	+30 (1.18)	–

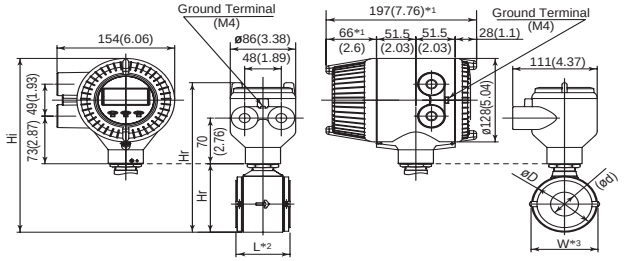
*3: Waterproof glands and a 30 m long cable are attached to each submersible style flowtube. Add 9.5 kg (20.9 lb) to the weight in the table.

AXF Standard, AXF025-AXF125, Wafer Type, PFA / Polyurethane Rubber /Natural Soft Rubber / EPDM Rubber Lining

Unit : mm (approx. in)

Integral Flowmeter Remote Flowtube Integral Flowmeter Remote Flowtube

AXF025
AXF032
AXF040
AXF050 G
AXF065 W
AXF080 C
AXF100
AXF125
— D E F N P 1 2 N A U D G □ 1 2 □ — A □ □ 1



Model	Size code		025	032	040	050	065	080	100	125
	Size		25(1)	32(1.25)	40(1.5)	50(2)	65(2.5)	80(3)	100(4)	125(5)
	Lining code		A,U	A,U	A,U	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G
Remote flowtube / Integral flowmeter	Face-to-face length	L $^{0}_{-3}$ *2	60(2.36)	70(2.76)	70(2.76)	80(3.15)	100(3.94)	120(4.72)	150(5.91)	200(7.87)
	Outside dia.	ØD	67.5(2.66)	73(2.87)	86(3.39)	99(3.90)	117(4.61)	129(5.08)	155(6.10)	183(7.20)
	Inner diameter of Grounding ring	Ød	28(1.10)	34(1.34)	41(1.61)	53(2.09)	66(2.60)	77(3.03)	102(4.02)	128(5.04)
	Width	W *3	67.5(2.66)	73(2.87)	86(3.39)	99(3.90)	117(4.61)	129(5.08)	155(6.10)	183(7.20)
	Height	H1	92(3.62)	98(3.86)	111(4.37)	129(5.08)	147(5.79)	157(6.18)	183(7.20)	212(8.35)
Remote flowtube	Max. Height	Hr	216(8.50)	222(8.74)	235(9.25)	253(9.96)	271(10.67)	281(11.06)	307(12.09)	336(13.23)
	Weight kg (lb) *3		1.9(4.1)	2.0(4.5)	2.2(4.9)	2.7(5.8)	3.4(7.6)	4.1(9.1)	5.6(12.3)	9.3(20.4)
Integral flowmeter	Max. Height	Hi	254(9.98)	259(10.18)	273(10.73)	291(11.44)	309(12.17)	319(12.54)	345(13.56)	374(14.70)
	Weight kg (lb)		3.6(7.8)	3.7(8.2)	3.9(8.7)	4.4(9.6)	5.1(11.3)	5.8(12.9)	7.3(16.0)	11.0(24.2)

*1: When indicator code N is selected, subtract 12 mm (0.47 inch) from the value in the figure
For explosion proof style with indicator add 5mm (0.2inch) to it..

*2: Depending on the selection of grounding ring code and optional code, add the following value to L (face-to-face length).

Grounding Ring Code		S, L, H, V	P, T	N
Option Code	None	+0	+26(1.02)	-2(0.08)
	GA, GC, GD (Special Gaskets)	+8 (0.31)	+30 (1.18)	–

*3: When electrode structure 2 is selected, add the following value to W (width).

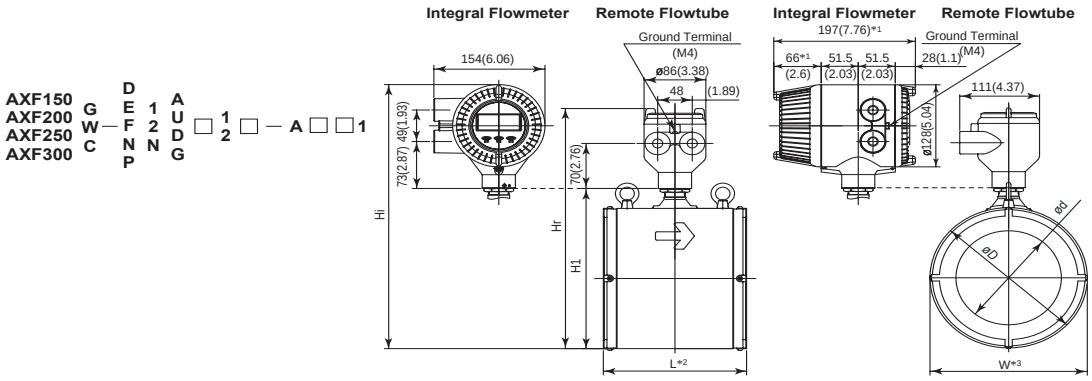
Nominal Size	25	32, 40, 50	65, 80	100	125
W	+52.5 (2.06)	+52 (2.05)	+49 (1.93)	+48 (1.89)	+47 (1.85)

*4: Waterproof glands and a 30 m long cable are attached to each submersible type flowtube. Add 9.5 kg (20.9 lb) to the weight in the table.

F23.EPS

AXF Standard, AXF150-AXF300, Wafer Type, PFA / Polyurethane Rubber / Natural Soft Rubber / EPDM Rubber Lining

Unit : mm (approx. in)



AXF150, AXF200, AXF250, AXF300 — GWC — DEFNP 12N AUDG □12 □ — A□□1

Model	Size code		150	200	250	300
	Size		150(6)	200(8)	250(10)	300(12)
	Lining code		A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G
Remote flowtube / Integral flowmeter	Face-to-face length	L $^{0}_{-3}$ *2	200 $^{0}_{-3}$(7.87)	250 $^{0}_{-3}$(9.84)	300 $^{0}_{-3}$(11.81)	350 $^{0}_{-3}$(13.78)
Remote flowtube / Integral flowmeter	Outside dia.	ØD	202(7.95)	252(9.92)	310(12.20)	358(14.09)
Remote flowtube / Integral flowmeter	Inner diameter of Grounding ring	Ød	146.1(5.75)	193.6(7.62)	243.7(9.59)	294.7(11.60)
Remote flowtube / Integral flowmeter	Width	W*3	202(7.95)	252(9.92)	310(12.20)	358(14.09)
Remote flowtube / Integral flowmeter	Height	H1	243(9.57)	293(11.54)	354(13.94)	402(15.83)
Remote flowtube	Max. Height	Hr	367(14.45)	417(16.42)	478(18.82)	526(20.71)
Remote flowtube	Weight kg (lb) *4		14.5(32.0)	22.1(48.7)	39.0(86.0)	48.3(106.5)
Integral flowmeter	Max. Height	Hi	405(15.93)	455(17.89)	516(20.31)	564(22.20)
Integral flowmeter	Weight kg (lb)		16.2(35.7)	23.8(52.4)	40.7(89.7)	50.0(110.2)

*1: When indicator code N is selected, subtract 12 mm (0.47 in) from the value in the figure.
For explosion proof style with indicator add 5 mm (0.2 in) to it.

*2: Depending on the selection of grounding ring code and optional code, add the following value to L (face-to-face length).

Nominal Size: 150 to 200mm				
Grounding Ring Code		S, L, H, V	P, T	N
Option Code	None	+0	+32 (1.26)	-2(0.08)
	GA, GC, GD (Special Gaskets)	+10 (0.39)	+38 (1.5)	–

Nominal Size: 250 to 300mm			
Grounding Ring Code	S, L, H, V	P, T	N
Option Code is "None"	+0	–	-2 (0.08)

*3: When electrode structure 2 is selected, add the following value to W(width).

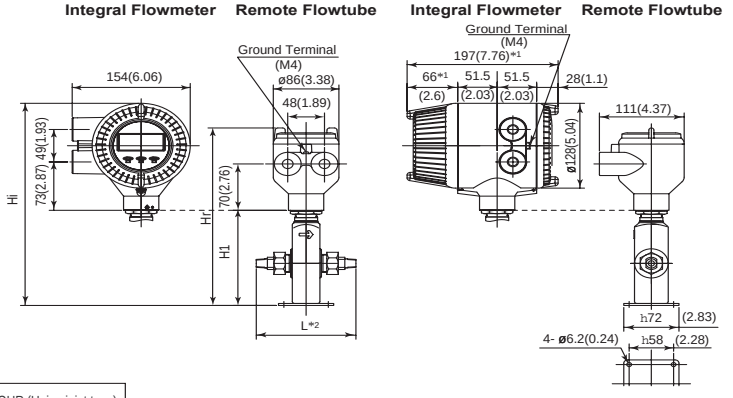
Nominal size	150	200	250	300
W	+49 (1.93)	+50 (1.97)	+49 (1.93)	+53 (2.09)

*4: Waterproof glands and a 30 m long cable are attached to each submersible style flowtube. Add 9.5 kg (20.9 lb) to the weight in

F24.EPS

AXF Standard, AXF002-AXF010, Weld and· Union Joint, Ceramics Lining

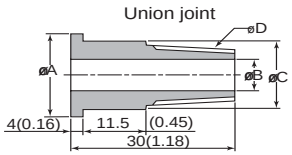
Unit : mm (approx. inch)



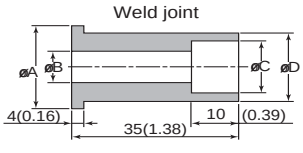
AXF002, AXF005, AXF010 — GC — DEFNP 12N CE1N — GUW NR1

Model	Process connection		GUW (Welding type)			GUN/GUR (Union joint type)		
	Size code		002	005	010	002	005	010
	Size		2.5 (0.1)	5 (0.2)	10 (0.4)	2.5 (0.1)	5 (0.2)	10 (0.4)
	Lining code		C	C	C	C	C	C
Remote flowtube / Integral flowmeter	Face-to-face length	L $^{0}_{-3}$	140 (5.51)			130 (5.12)		
Remote flowtube / Integral flowmeter	Height	H1	144 (5.67)			144 (5.67)		
Remote flowtube	Max. Height	Hr	268 (10.55)			268 (10.55)		
Remote flowtube	Weight kg (lb)		2.3 (5.1)			2.3 (5.1)		
Integral flowmeter	Max. Height	Hi	306 (12.03)			306 (12.03)		
Integral flowmeter	Weight kg (lb)		4 (8.8)			4 (8.8)		

*1: When indicator code N is selected, subtract 12 mm (0.47 in) from the value in the figure
For explosion proof style with indicator add 5 mm (0.2 in) to it.



Size	A	B	C	D
2.5 (0.1)	22 (0.87)	8 (0.31)	18.5 (0.73)	R1/4
	22 (0.87)	8 (0.31)	18.5 (0.73)	NPT1/4
5 (0.2)	22 (0.87)	8 (0.31)	18.5 (0.73)	R1/4
	22 (0.87)	8 (0.31)	18.5 (0.73)	NPT1/4
10 (0.4)	25 (0.98)	10 (0.39)	22.5 (0.89)	R3/8
	25 (0.98)	10 (0.39)	22.5 (0.89)	NPT3/8



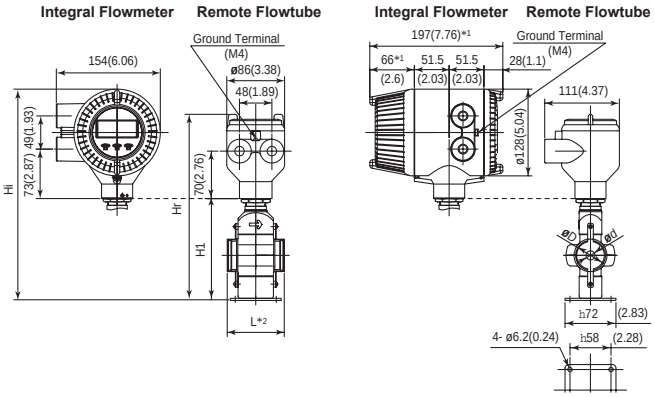
Size	A	B	C	D
2.5 (0.1)	22 (0.87)	8 (0.31)	14.3 (0.56)	18.5 (0.73)
5 (0.2)	22 (0.87)	8 (0.31)	14.3 (0.56)	18.5 (0.73)
10 (0.4)	25 (0.98)	10 (0.39)	17.8 (0.70)	22.5 (0.89)

F25.EPS

AXF Standard, AXF015, Wafer Type, Ceramics Lining

Unit : mm (approx. in)

AXF015 G C — D E F N P 1 2 N C E 1 □ — A □ □ 1



Model	Size code		015
	Size		15(0.5)
	Lining code		C
Remote flowtube / Integral flowmeter	Face-to-face length	L_3^{0*2}	85 (3.35)
	Outside dia.	ØD	44 (1.73)
	Inner diameter of Grounding ring	Ød	15 (0.59)
	Height	H1	144 (5.67)
Remote flowtube	Max. Height	Hr	268 (10.55)
	Weight kg (lb)		2.3 (5.1)
Integral flowmeter	Max. Height	Hi	306 (12.03)
	Weight kg (lb)		4 (8.8)

*1: When indicator code N is selected, subtract 12 mm (0.47 in) from the value in the figure.
For explosion proof style with indicator add 5mm (0.2in) to it.
*2: Depending on the selection of grounding ring code and optional code, add the following value to L (face-to-face length).

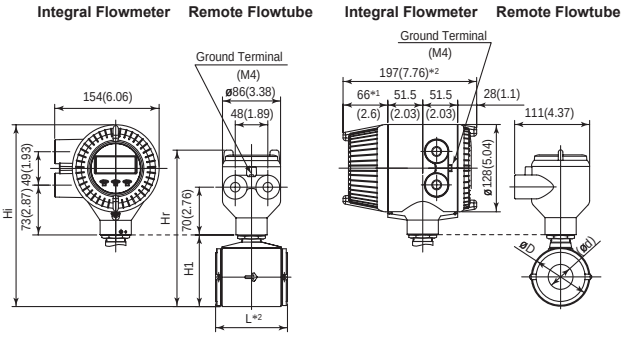
Grounding Ring Code	S, L, H, V	P, T	N
L(Face-to-face length)	+0	+22 (087)	-6 (0.24)

F26.EPS

AXF Standard, AXF025-AXF100, Wafer Type, Ceramics Lining

Unit : mm (approx. in)

AXF025
AXF040
AXF050
AXF080
AXF100
G C — D E F N P 1 2 N C E 1 □ — A □ □ 1



			025	040	050	080	100
Model	Size code		025	040	050	080	100
	Size		25(1)	40(1.5)	50(2)	80(3)	100(4)
	Lining code		C	C	C	C	C
Remote flowtube / Integral flowmeter	Face-to-face length	L_3^{0*2}	93(3.66)	106(4.17)	120(4.72)	160(6.30)	180(7.09)
	Outside dia.	ØD	67.5(2.66)	86(3.39)	99(3.90)	129(5.08)	155(6.10)
	Inner diameter of Grounding ring	Ød	27(1.06)	40(1.57)	52(2.05)	81(3.19)	98(3.86)
	Height	H1	92(3.62)	111(4.37)	129(5.08)	159(6.26)	184(7.24)
Remote flowtube	Max. Height	Hr	216(8.50)	235(9.25)	253(9.96)	283(11.14)	308(12.13)
	Weight kg (lb)		2.3(5.1)	3.2(7.0)	4.1(9.0)	6.8(15.0)	9.6(21.1)
Integral flowmeter	Max. Height	Hi	254(9.98)	273(10.73)	291(11.44)	321(12.64)	346(13.62)
	Weight kg (lb)		4.0(8.8)	4.9(10.8)	5.8(12.7)	8.5(18.8)	11.3(24.9)

*1: When indicator code N is selected, subtract 12 mm (0.47 in) from the value in the figure.
For explosion proof style with indicator add 5 mm (0.2 in) to it.
*2: Depending on the selection of grounding ring code and optional code, add the following value to L (face-to-face length).

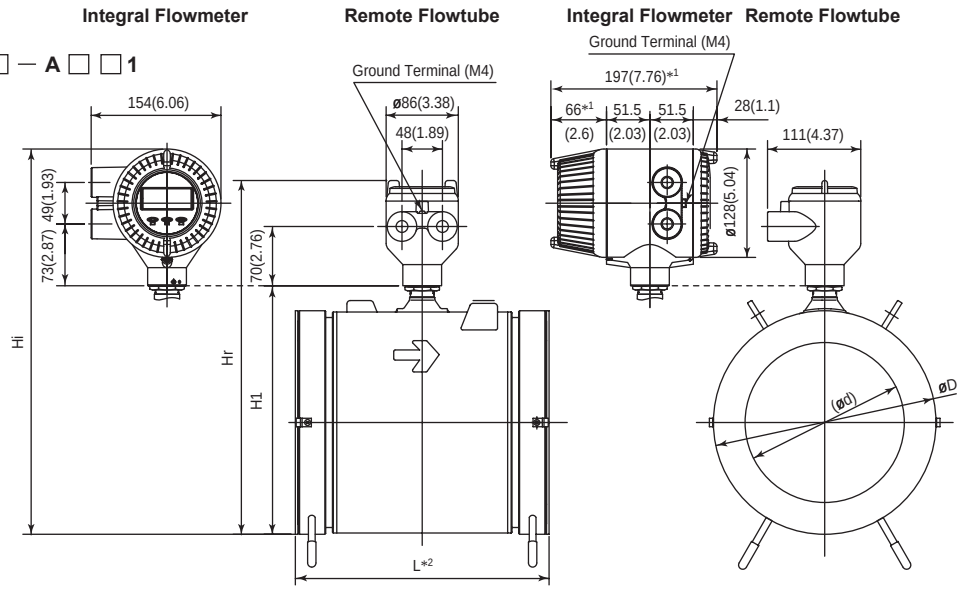
Grounding Ring Code	S, L, H, V	P, T	N
L(Face-to-face length)	+0	+22 (0.87)	-6 (0.24)

F27.EPS

AXF Standard, AXF150, AXF200, Wafer Type, Ceramics Lining

Unit: mm (approx. in)

AXF150G
AXF200C — D E F N P 1 2 N C E 1 □ — A □ □1



Model	Size code		150	200
	Size		150(6)	200(8)
	Lining code		C	C
Remote flowtube / Integral flowmeter	Face-to-face length	L^{0}_{-3} *2	232 (9.13)	302 (11.89)
	Outside dia.	ØD	214 (8.43)	264 (10.39)
	Inner diameter of Grounding ring	Ød	144 (5.67)	192 (7.56)
	Height	H1	254 (10.00)	304 (11.97)
Remote flowtube	Max. Height	Hr	378 (14.88)	428 (16.85)
	Weight kg (lb)		20.2 (44.5)	33.5 (73.9)
Integral flowmeter	Max. Height	Hi	416 (16.36)	466 (18.33)
	Weight kg (lb)		21.9 (48.3)	35.2 (77.6)

*1: When indicator code N is selected, subtract 12 mm (0.47 in) from the value in the figure
. For explosion proof style with indicator add 5 mm (0.2 in) to it.
*2: Depending on the selection of grounding ring code and optional code, add the following value to L (face-to-face length).

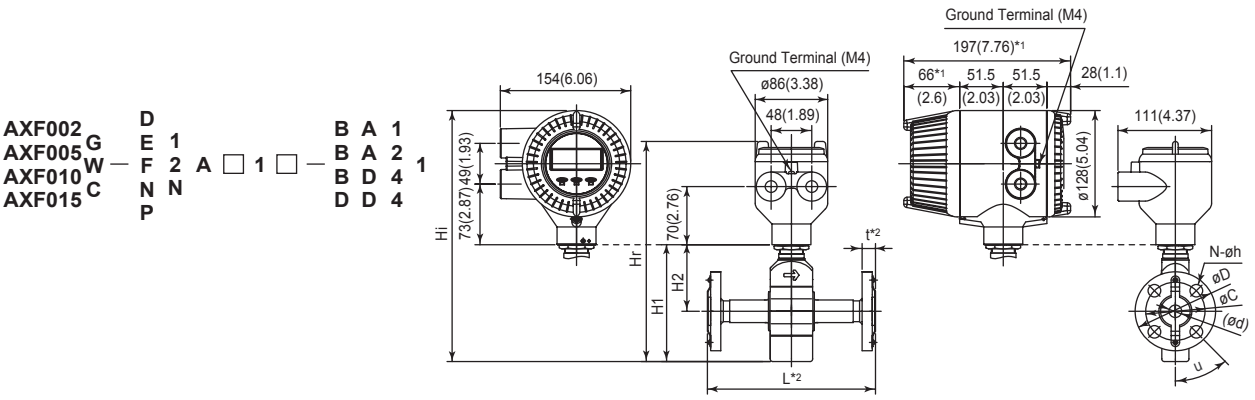
Grounding Ring Code	S, L, H, V	P, T	N
L(Face-to-face length)	+0	+30 (1.18)	-6 (0.24)

F28.EPS

AXF Standard, AXF002-AXF015, ANSI/DIN Flange Type, PFA Lininig

Unit: mm (approx. in)

Integral Flowmeter **Remote Flowtube** **Integral Flowmeter** **Remote Flowtube**



Model	Process Connection		BA1(ANSI Class 150)				BA2(ANSI Class 300)				BD4(DIN PN40)				DD4(DIN PN40)		
	Size code		002	005	010	015	002	005	010	015	002	005	010	015	002	005	010
	Size		2.5 (0.1)	5 (0.2)	10 (0.4)	15 (0.5)	2.5 (0.1)	5 (0.2)	10 (0.4)	15 (0.5)	2.5 (0.1)	5 (0.2)	10 (0.4)	15 (0.5)	2.5 (0.1)	5 (0.2)	10 (0.4)
	Lining code		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Remote flowtube / Integral flowmet.	Face-to-face length	L $^{0}_{-3}$ *2	150(5.91)			200 (7.87)	150(5.91)			200 (7.87)	150(5.91)			200 (7.87)	150(5.91)		
	Outside dia.	øD	88.9(3.50)				95.3(3.75)				95(3.74)				90(3.54)		
	Thickness	t *2	15.2(0.60)				18.2(0.72)				20(0.79)				20(0.79)		
	Inner diameter of Grounding ring	ød	15(0.59)				15(0.59)				15(0.59)				15(0.59)		
	Pitch circle dia.	øC	60.5(2.38)				66.5(2.62)				65(2.56)				60(2.36)		
	Bolt hole interval	u°	45				45				45				45		
	Hole dia.	øh	15.7(0.62)				15.7(0.62)				14(0.55)				14(0.55)		
	Number of holes	N	4				4				4				4		
	Height	H1	141(5.54)				141(5.54)				141(5.54)				141(5.54)		
	Height	H2	80(3.15)				80(3.15)				80(3.15)				80(3.15)		
Remote flowtube	Max. Height	Hr	265(10.43)				265(10.43)				265(10.43)				265(10.43)		
	Weight kg (lb) *3		3.3(7.2)				3.7(8.2)				3.9(8.6)				4.0(8.8)		
Integral flowmet.	Max. Height	Hi	302(11.89)				302(11.89)				302(11.89)				302(11.89)		
	Weight kg (lb)		5.0(10.9)				5.4(11.9)				5.6(12.4)				5.7(12.5)		

*1: When indicator code N is selected, subtract 12 mm (0.47 in) from the value in the figure.
For explosion proof style with indicator add 5 mm (0.2 in) to it.

*2: Depending on the selection of grounding ring code and optional code, add the following value to “L” (face-to-face length) and “t” (thickness of flange).

		L	t	L	t	L	t
Grounding Ring Code		S, L, H, V		P, T		N	
Option Code	None	+0	+0	+26(1.02)	+13(0.51)	-2(0.08)	-1(0.04)
	GA, GC, GD (Special Gaskets)	+8(0.31)	+4(0.16)	+30(1.18)	+15(0.59)	–	–

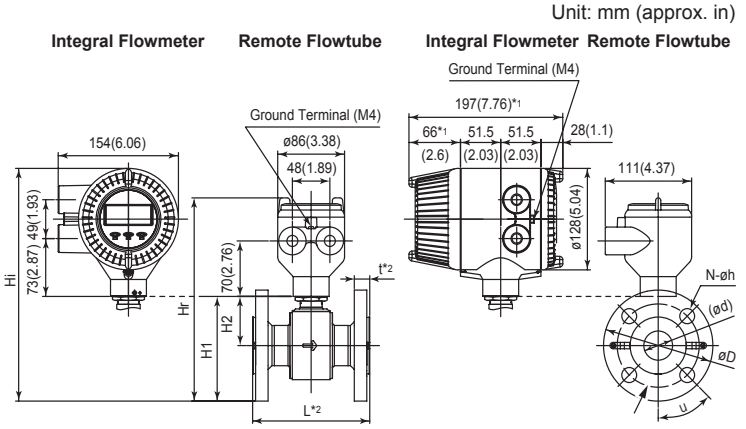
*3: Waterproof glands and a 30 m long cable are attached to each submersible type flowtube. Add 9.5 kg (20.9 lb) to the weight in the table.

F29.EPS

AXF Standard, AXF025-AXF050, ANSI/DIN Flange Type, PFA / Polyurethane Rubber / Natural Soft Rubber / EPDM Rubber Lining

Unit: mm (approx. in)

AXF025 AXF032 AXF040 AXF050 — G W C — D E F N P — 1 2 N — A U D G — □ 1 2 — □ — B B B — A A D — 1 2 4



Model	Process Connection		BA1 (ANSI Class 150)				BA2 (ANSI Class 300)				BD4 (DIN PN40)			
	Size code		025	032	040	050	025	032	040	050	025	032	040	050
	Size		25 (1)	32 (1.25)	40 (1.5)	50 (2)	25 (1)	32 (1.25)	40 (1.5)	50 (2)	25 (1)	32 (1.25)A	40 (1.5)	50 (2)
	Lining code		A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G
Remote flowtube / Integral flowmeter	Face-to-face length	L^{0}_{-3} *2	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)	200 (7.87)
	Outside dia.	øD	108.0 (4.25)	117.3 (4.62)	127.0 (5.00)	152.4 (6.00)	124.0 (4.88)	133.4 (5.25)	155.4 (6.12)	165.1 (6.50)	115 (4.53)	140 (5.51)	150 (5.91)	165 (6.50)
	Thickness	t *2	18.2 (0.72)	19.7 (0.78)	21.5 (0.85)	23.1 (0.91)	21.5 (0.85)	23.1 (0.91)	24.6 (0.97)	26.4 (1.04)	22 (0.87)	22 (0.87)	22 (0.87)	24 (0.94)
	Inner diameter of Grounding ring	ød	28 (1.10)	34 (1.34)	41 (1.61)	53 (2.09)	28 (1.10)	34 (1.34)	41 (1.61)	53 (2.09)	28 (1.10)	34 (1.34)	41 (1.61)	53 (2.09)
	Pitch circle dia.	øC	79.2 (3.12)	88.9 (3.50)	98.6 (3.88)	120.7 (4.75)	88.9 (3.50)	98.6 (3.88)	114.3 (4.50)	127.0 (5.00)	85 (3.35)	100 (3.94)	110 (4.33)	125 (4.92)
	Bolt hole interval	u°	45	45	45	45	45	45	45	22.5	45	45	45	45
	Hole dia.	øh	15.7 (0.62)	15.7 (0.62)	15.7 (0.62)	19.1 (0.75)	19.1 (0.75)	19.1 (0.75)	22.4 (0.88)	19.1 (0.75)	14 (0.75)	19 (0.75)	19 (0.75)	18 (0.71)
	Number of holes	N	4	4	4	4	4	4	4	8	4	4	4	4
	Height	H1	112 (4.40)	120 (4.71)	131 (5.17)	155 (6.11)	120 (4.72)	128 (5.02)	146 (5.73)	162 (6.36)	115 (4.54)	131 (5.15)	143 (5.63)	162 (6.36)
	Height	H2	58 (2.28)	61 (2.40)	68 (2.67)	79 (3.11)	58 (2.28)	61 (2.40)	68 (2.67)	79 (3.11)	58 (2.28)	61 (2.40)	68 (2.67)	79 (3.11)
Remote flowtube	Max. Height	Hr	236 (9.28)	244 (9.59)	255 (10.05)	279 (10.99)	244 (9.60)	252 (9.90)	270 (10.61)	286 (11.24)	239 (9.42)	255 (10.03)	267 (10.51)	286 (11.24)
	Weight kg (lb) *3		3.9 (8.5)	4.5 (9.9)	5.4 (11.9)	7.4 (16.4)	5.0 (11.0)	5.8 (12.9)	7.8 (17.1)	9.0 (19.8)	4.7 (10.4)	6.1 (13.4)	6.9 (15.2)	8.7 (19.2)
Integral flowmeter	Max. Height	Hi	273 (10.76)	281 (11.06)	293 (11.53)	31.7 (12.47)	281 (11.07)	289 (11.38)	307 (12.09)	323 (12.72)	277 (10.90)	292 (11.51)	304 (11.98)	323 (12.72)
	Weight kg (lb)		5.6 (12.2)	6.2 (13.6)	7.1 (15.7)	9.1 (20.1)	6.7 (14.7)	7.5 (16.6)	9.5 (20.8)	10.7 (23.6)	6.4 (14.1)	7.8 (17.2)	8.6 (19.0)	10.4 (22.9)

*1: When indicator code N is selected, subtract 12 mm (0.47 in) from the value in the figure
For explosion proof style with indicator add 5 mm (0.2 in) to it.

*2: Depending on the selection of grounding ring code and optional code, add the following value to "L" (face-to-face length) and "t" (thickness of flange).

		L	t	L	t	L	t
Grounding Ring Code		S, L, H, V		P, T		N	
Option Code	None	+0	+0	+26(1.02)	+13(0.51)	-2(0.08)	-1(0.04)
	GA, GC, GD (Special Gaskets)	+8(0.31)	+4(0.16)	+30(1.18)	+15(0.59)	–	–

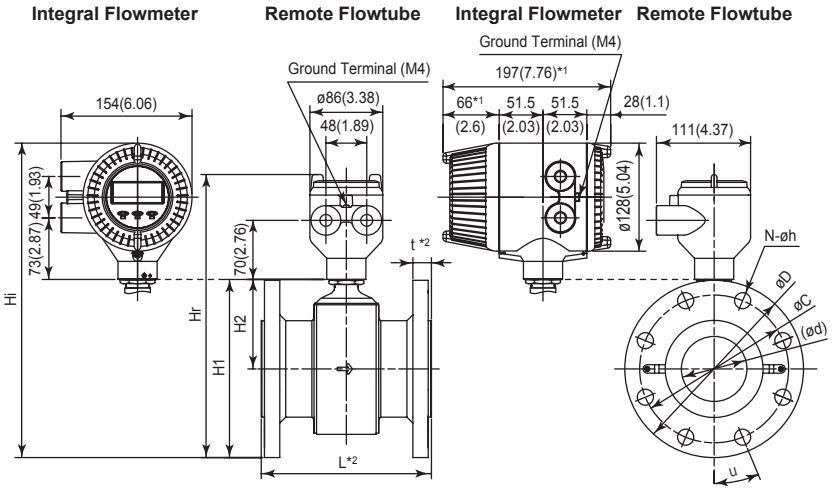
*3: Waterproof glands and a 30 m long cable are attached to each submersible style flowtube. Add 9.5 kg (20.9 lb) to the weight in the table.

F30.EPS

AXF Standard, AXF065-AXF125, ANSI/DIN Flange Type, PFA / Polyurethane Rubber / Natural Soft Rubber / EPDM Rubber Lining

Unit: mm (approx. in)

AXF065 AXF080 AXF100 AXF125 G W C — D E F N P 1 2 N A U D G □ 1 2 □ — B C A D C A D 2 □ 2 1



Model	Process Connection		BA1, CA1 (ANSI Class 150)				BA2, CA2 (ANSI Class 300)				BD2, CD2 (DIN PN16)			
	Size code		065	080	100	125	065	080	100	125	065	080	100	125
	Size		65 (2.5)	80 (3)	100 (4)	125 (5)	65 (2.5)	80 (3)	100 (4)	125 (5)	65 (2.5)	80 (3)	100 (4)	125 (5)
	Lining code		A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G
Remote flowtube	Face-to-face length	L $^{0}_{-3}$ *2	200 (7.87)	200 (7.87)	250 (9.84)	250 (9.84)	200 (7.87)	200 (7.87)	250 (9.84)	250 (9.84)	200 (7.87)	200 (7.87)	250 (9.84)	250 (9.84)
	Outside dia.	øD	177.8 (7.00)	190.5 (7.50)	228.6 (9.00)	254.0 (10.00)	190.5 (7.50)	209.6 (8.25)	254.0 (10.00)	279.4 (11.00)	185 (7.28)	200 (7.87)	220 (8.66)	250 (9.84)
	Thickness	t *2	26.4 (1.04)	27.9 (1.10)	27.9 (1.10)	27.9 (1.10)	29.4 (1.16)	32.4 (1.28)	35.8 (1.41)	39.1 (1.54)	24 (0.94)	24 (0.94)	24 (0.94)	26 (1.02)
	Inner diameter of Grounding ring	ød	66 (2.60)	77 (3.03)	102 (4.02)	128 (5.04)	66 (2.60)	77 (3.03)	102 (4.02)	128 (5.04)	66 (2.40)	77 (2.87)	102 (3.82)	128 (5.04)
	Pitch circle dia.	øC	139.7 (5.50)	152.4 (6.00)	190.5 (7.50)	215.9 (8.50)	149.4 (5.88)	168.1 (6.62)	200.2 (7.88)	235.0 (9.25)	145 (5.71)	160 (6.30)	180 (7.09)	210 (8.27)
Integral flowmeter	Bolt hole interval	u°	45	45	22.5	22.5	22.5	22.5	22.5	22.5	45	22.5	22.5	22.5
	Hole dia.	øh	19.1 (0.75)	19.1 (0.75)	19.1 (0.75)	22.4 (0.88)	22.4 (0.88)	22.4 (0.88)	22.4 (0.88)	22.4 (0.88)	19 (0.75)	19 (0.75)	19 (0.75)	19 (0.75)
	Number of holes	N	4	4	8	8	8	8	8	8	4	8	8	8
	Height	H1	177 (6.97)	190 (7.48)	220 (8.66)	247 (9.72)	184 (7.24)	200 (7.87)	233 (9.16)	260 (10.22)	180 (7.07)	193 (7.59)	216 (8.49)	245 (9.65)
	Height	H2	89 (3.50)	95 (3.74)	106 (4.16)	120 (4.72)	89 (3.50)	95 (3.74)	106 (4.16)	120 (4.72)	87 (3.43)	93 (3.65)	106 (4.16)	120 (4.72)
Remote flowtube	Max. Height	Hr	301 (11.85)	314 (12.36)	344 (13.54)	371 (14.61)	308 (12.13)	324 (12.76)	357 (14.04)	384 (15.11)	304 (11.95)	317 (12.47)	340 (13.37)	369 (14.53)
	Weight kg (lb) *3		10.8 (23.7)	12.9 (28.5)	17.7 (39.1)	20.8 (45.9)	12.6 (27.7)	16.6 (36.6)	26.8 (59.1)	34.9 (76.9)	10.6 (23.3)	11.9 (26.2)	14.5 (32.0)	19.3 (42.5)
Integral flowmeter	Max. Height	Hi	339 (13.35)	352 (13.86)	382 (15.02)	409 (16.08)	346 (13.62)	362 (14.25)	394 (15.52)	421 (16.58)	341 (13.43)	354 (13.94)	377 (14.85)	407 (16.00)
	Weight kg (lb)		12.5 (27.5)	14.6 (32.2)	19.4 (42.8)	22.5 (49.6)	14.3 (31.4)	18.3 (40.4)	28.5 (62.8)	36.6 (80.7)	12.3 (27.1)	13.6 (29.9)	16.2 (35.7)	21.0 (46.2)

*1: When indicator code N is selected, subtract 12 mm (0.47 in) from the value in the figure.
For explosion proof style with indicator add 5 mm (0.2 in) to it..

*2: Depending on the selection of grounding ring code and optional code, add the following value to “L” (face-to-face length) and “t” (thickness of flange).

		L	t	L	t	L	t
Grounding Ring Code		S, L, H, V		P, T		N	
Option Code	None	+0	+0	+26(1.02)	+13(0.51)	-2(0.08)	-1(0.04)
	GA, GC, GD (Special Gaskets)	+8(0.31)	+4(0.16)	+30(1.18)	+15(0.59)	–	–

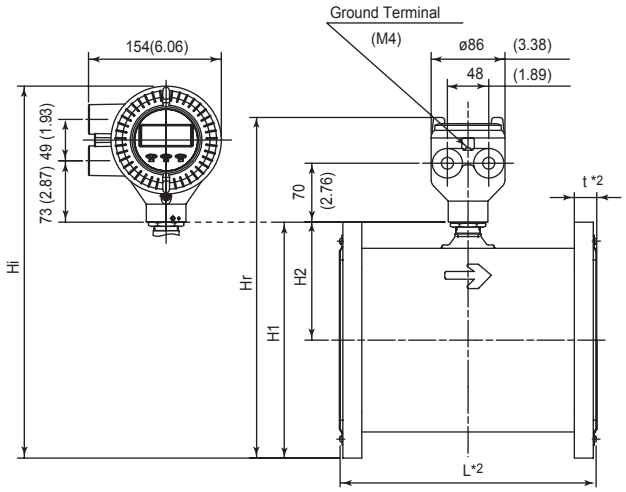
*3: Waterproof glands and a 30 m long cable are attached to each submersible style flowtube. Add 9.5 kg (20.9 lb) to the weight in the table. F31.EPS

AXF Standard, AXF150, AXF200, ANSI/DIN Flange Type, PFA / Polyurethane Rubber / Natural Soft Rubber / EPDM Rubber Lining

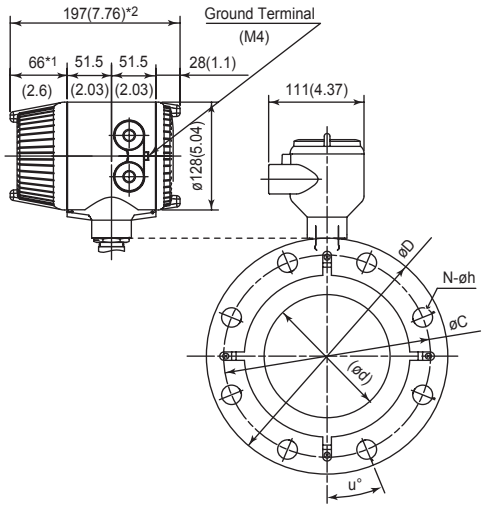
Unit: mm (approx. in)

AXF150 AXF200 G W C — D E F N P 1 2 N A U D G □ 1 2 □ — B B C C A D A D □ □ □ 1

Integral Flowmeter Remote Flowtube



Integral Flowmeter Remote Flowtube



	Process Connection		BA1/CA1(ANSI Class 150)		BA2/CA2(ANSI Class 300)		BD1/CD1(DIN PN10)	BD2/CD2(DIN PN16)	
Model	Size code		150	200	150	200	200	150	200
	Size		150 (6)	200 (8)	150 (6)	200 (8)	200 (8)	150 (6)	200 (8)
	Lining code		A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G
Remote flowtube	Face-to-face length	L $^{0}_{-3}$ *2	300 (11.81)	350 (13.78)	300 (11.81)	350 (13.78)	350 (13.78)	300 (11.81)	350 (13.78)
	Outside dia.	øD	279.4 (11.00)	342.9 (13.50)	317.5 (12.50)	381.0 (15.00)	340 (13.39)	285 (11.22)	340 (13.39)
	Thickness	t *2	30.4 (1.20)	33.4 (1.31)	43.5 (1.71)	46.1 (1.81)	29 (1.14)	27 (1.06)	29 (1.14)
	Inner diameter of Grounding ring	ød	140.7 (5.54))	188.9 (7.44)	140.7 (5.54))	188.9 (7.44)	188.9 (7.44)	140.7 (5.54))	188.9 (7.44)
	Pitch circle dia.	øC	241.3 (9.50)	298.5 (11.75)	269.7 (10.62)	330.2 (13.00)	295 (11.61)	240 (9.45)	295 (11.61)
Integral flowmeter	Bolt hole interval	u°	22.5	22.5	15	15	22.5	22.5	15
	Hole dia.	øh	22.4 (0.88)	22.4 (0.88)	22.4 (0.88)	25.4 (1.00)	23 (0.91)	23 (0.91)	23 (0.91)
	Number of holes	N	8	8	12	12	8	8	12
	Height	H1	281 (11.05)	337 (13.29)	300 (11.80)	357 (14.04)	336 (13.23)	284 (11.16)	336 (13.23)
	Height	H2	141 (5.55)	166 (6.54)	141 (5.55)	166 (6.54)	166 (6.54)	141 (5.55)	166 (6.54)
Remote flowtube	Max. Height	Hr	405 (15.93)	461 (18.17)	424 (16.68)	481 (18.92)	460 (18.11)	408 (16.04)	460 (18.11)
	Weight kg (lb) *3		30.9 (68.0)	49.2 (108.4)	52.5 (115.7)	78.8 (173.7)	42.5 (93.7)	28.7 (63.2)	41.9 (92.5)
Integral flowmeter	Max. Height	Hi	442 (17.41)	499 (19.64)	461 (18.16)	518 (20.39)	498 (19.59)	445 (17.52)	498 (19.59)
	Weight kg (lb)		32.6 (71.8)	50.9 (112.2)	54.2 (119.5)	80.5 (177.5)	44.2 (97.5)	30.4 (66.9)	43.6 (96.2)

*1: When indicator suffix code N is selected, subtract 12 mm (0.47 in) from the value in the figure.
For explosion proof style with indicator add 5 mm (0.2 in) to it..

*2: Depending on the selection of grounding ring code and optional code, add the following value to “L” (face-to-face length) and “t” (thickness of flange).

		L	t	L	t	L	t
Grounding Ring Code		S, L, H, V		P, T		N	
Option Code	None	+0	+0	+34(1.34)	+17(0.67)	-2(0.08)	-1(0.04)
	GA, GC, GD (Special Gaskets)	+10(0.39)	+5(0.20)	+38(1.5)	+19(0.75)	–	–

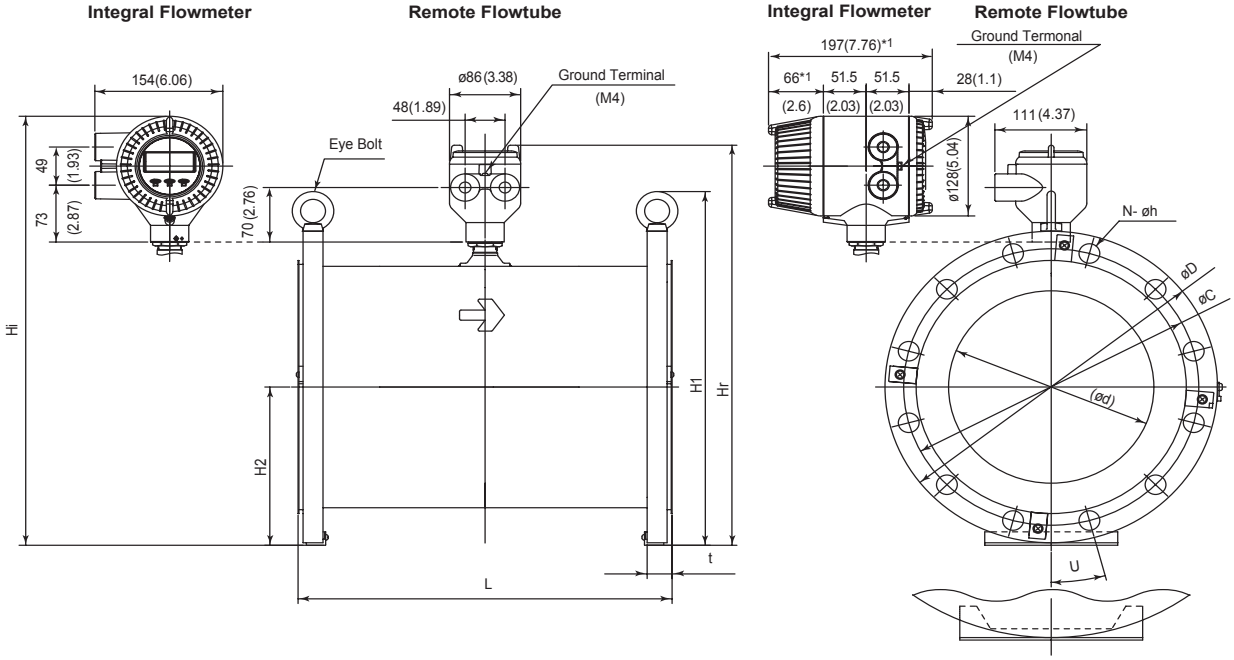
*3: Waterproof glands and a 30 m long cable are attached to each submersible style flowtube. Add 9.5 kg (20.9 lb) to the weight in the table.

F32.EPS

AXF Standard, AXF250-AXF400, ANSI/DIN Flange Type, PFA / Polyurethane Rubber / Natural Soft Rubber / EPDM Rubber Lining

Unit: mm (approx. in)

AXF250 AXF300 AXF350 AXF400 — G W C — D E F N P — 1 2 N — A U D G □ — 1 2 □ — B B C C — A D A D — □ □ □ □ — 1



for AXF300, AXF350, AXF400

	Process Connection		BA1/CA1 (ANSI Class 150)				BA2/CA2 (ANSI Class 300)		BD1/CD1 (DIN PN10)				BD2/CD2 (DIN PN16)	
Model	Size code		250	300	350	400	250	300	250	300	350	400	250	300
	Size		250 (10)	300 (12)	350 (14)	400 (16)	250 (10)	300 (12)	250 (10)	300 (12)	350 (14)	400 (16)	250 (10)	300 (12)
	Lining code		A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G	A,U,D,G
Remote flowtube	Face-to-face length	L $^{0}_{-5}$ *2	450 (17.72)	500 (19.69)	550 (21.65)	600 (23.62)	450 (17.72)	500 (19.69)	450 (17.72)	500 (19.69)	550 (21.65)	600 (23.62)	450 (17.72)	500 (19.69)
	Outside dia.	øD	406.4 (16.00)	482.6 (19.00)	533.4 (21.00)	596.9 (23.50)	444.5 (17.50)	520.7 (20.50)	395 (15.55)	445 (17.52)	505 (19.88)	565 (22.24)	405 (15.94)	460 (18.11)
	Thickness	t *2	38.2 (1.50)	39.7 (1.56)	45.0 (1.77)	46.5 (1.83)	55.7 (2.19)	58.8 (2.31)	34 (1.34)	34 (1.34)	36 (1.42)	36 (1.42)	34 (1.34)	36 (1.42)
	Inner diameter of Grounding ring	ød	243 (9.57)	291.3 (11.47)	323.4 (12.73)	373.5 (14.70)	243 (9.56)	291.3 (11.47)	243 (9.57)	291.3 (11.47)	323.4 (12.73)	373.5 (14.70)	243 (9.57)	291.3 (11.47)
	Pitch circle dia.	øC	362.0 (14.25)	431.8 (17.00)	476.3 (18.75)	539.8 (21.25)	387.4 (15.25)	450.9 (17.75)	350 (13.78)	400 (15.75)	460 (18.11)	515 (20.28)	355 (13.98)	410 (16.14)
Integral flowmeter	Bolt hole interval	u°	15	15	15	11.25	11.25	11.25	15	15	11.25	11.25	15	15
	Hole dia.	øh	25.4 (1.00)	25.4 (1.00)	28.4 (1.12)	28.4 (1.12)	28.4 (1.12)	31.8 (1.25)	23 (0.91)	23 (0.91)	23 (0.91)	28 (1.10)	28 (1.10)	28 (1.10)
	Number of holes	N	12	12	12	16	16	16	12	12	16	16	12	12
	Height	H1	399 (15.72)	461 (18.16)	503 (19.79)	560 (22.05)	418 (16.47)	480 (18.91)	394 (15.49)	443 (17.42)	489 (19.23)	544 (21.42)	399 (15.69)	450 (17.72)
	Height	H2	196 (7.72)	220 (8.66)	236 (9.29)	262 (10.30)	196 (7.72)	220 (8.66)	196 (7.72)	220 (8.66)	236 (9.29)	262 (10.30)	196 (7.72)	220 (8.66)
Remote flowtube	Max. Height	Hr	523 (20.60)	585 (23.04)	627 (24.68)	684 (26.93)	542 (21.35)	604 (23.79)	518 (20.37)	567 (22.30)	613 (24.12)	668 (26.30)	523 (20.57)	574 (22.60)
	Weight kg (lb)*3		83.4 (183.8)	104.5 (230.4)	151.5 (334.0)	184.9 (407.7)	133.0 (293.1)	176.7 (389.5)	73.0 (161.0)	79.4 (174.9)	112.5 (248.0)	129.7 (285.9)	74.8 (164.9)	87.9 (193.8)
Integral flowmeter	Max. Height	Hi	561 (22.07)	623 (24.52)	664 (26.15)	722 (28.41)	580 (22.82)	642 (25.27)	555 (21.85)	604 (23.78)	650 (25.59)	706 (27.78)	560 (22.05)	612 (24.07)
	Weight kg (lb)		85.1 (187.6)	106.2 (234.2)	153.2 (337.8)	186.6 (411.4)	134.7 (296.9)	178.4 (393.3)	74.7 (164.7)	81.1 (178.7)	114.2 (251.7)	131.4 (289.6)	76.5 (168.7)	89.6 (197.6)

*1: When indicator suffix code N is selected, subtract 12 mm (0.47 in) from the value in the figure. For explosion proof style with indicator add 5 mm (0.2 in) to it..

*2: Depending on the selection of grounding ring code and optional code, add the following value to “L” (face-to-face length) and “t” (thickness of flange).

Nominal Size: 250 mm to 300 mm				
	L	t	L	t
Grounding Ring Code	S, L, H, V		N	
Option Code is “None”	+0	+0	-6(0.24)	-3(0.12)

Nominal Size: 350 mm to 400 mm				
	L	t	L	t
Grounding Ring Code	S, L, H, V		N	
Option Code is “None”	+0	+0	-10(0.39)	-5(0.20)

*3: Waterproof glands and a 30 m long cable are attached to each submersible style flowtube. Add 9.5 kg (20.9 lb) to the weight in the table.

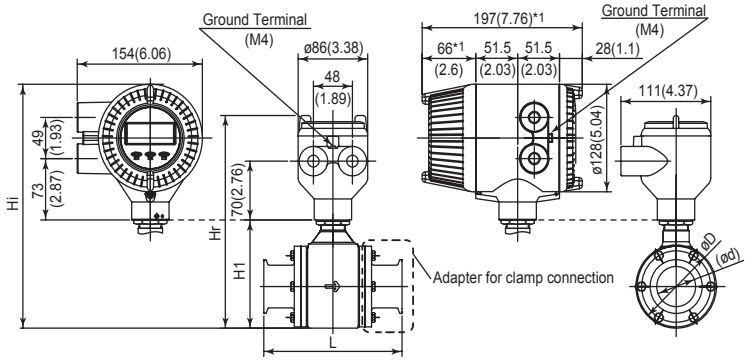
F33.EPS

AXF Standard, AXF015-AXF125, Sanitary for Clamp Connection, PFA Lining

Unit: mm (approx. in)

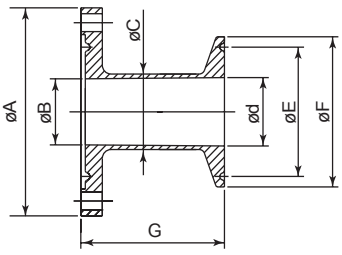
Integral Flowmeter **Remote Flowtube** **Integral Flowmeter** **Remote Flowtube**

AXF015															
AXF025															
AXF032		**D**													
AXF040		**E**	**1**							**H**	**A**	**B**			
AXF050	**H**	**F**	**2**	**A**	**L**	**1**	**N**	—	**H**	**D**	**B**	**1**			
AXF065		**N**	**N**						**H**	**K**	**B**				
AXF080		**P**													
AXF100															
AXF125															



Model											
	Process Connection			HAB (Tri–Clamp) / HDB (DIN 32676 Clamp) / HKB (ISO 2852 Clamp)							
	Size code			015	025	032	040	050	065	080	100	125
	Size			15 (0.5)	25 (1)	32 (1.3)	40 (1.5)	50 (2)	65 (2.6)	80 (3)	100 (4)	125 (5)
	Lining code			A	A	A	A	A	A	A	A	A
Remote flowtube / Integral flowmeter	Face-to-face length	L^{0}_{-3}		166 (6.55)	166 (6.55)	166 (6.55)	166 (6.55)	176 (6.94)	196 (7.73)	216 (8.52)	246 (9.70)	316 (12.46)
	Outside dia.	øD		73 (2.87)	73 (2.87)	73 (2.87)	86 (3.39)	99 (3.90)	117 (4.61)	129 (5.08)	155 (6.10)	183 (7.20)
	Inner dia.	ød	HAB	15.7 (0.62)	22.1 (0.87)	–	34.8 (1.37)	47.5 (1.87)	60.2 (2.37)	72.9 (2.87)	97.4 (3.83)	–
			HDB	16 (0.63)	26 (1.02)	32 (1.26)	38 (1.50)	50 (1.97)	66 (2.60)	81 (3.19)	100 (3.94)	125 (4.92)
			HKB	15.2 (0.60)	22.6 (0.89)	31.3 (1.23)	35.6 (1.40)	48.6 (1.91)	60.3 (2.37)	72.9 (2.87)	97.6 (3.84)	135.7 (5.34)
	Height	H1		98 (3.86)	98 (3.86)	98 (3.86))	111 (4.37)	129 (5.08)	147 (5.79)	157 (6.18)	183 (7.20)	212 (8.35)
Remote flowtube	Max. Height	Hr		222 (8.74)	222 (8.74)	222 (8.74)	235 (9.25)	253 (9.96)	271 (10.67)	281 (11.06)	307 (12.09)	336 (13.23)
	Weight kg (lb)			2.7 (6.0)	2.5 (5.5)	2.6 (5.7)	2.9 (6.4)	3.6 (7.9)	4.8 (10.6)	5.7 (12.6)	8.1 (17.9)	12.1 (26.7)
Integral flowmeter	Max. Height	Hi		260 (10.22)	260 (10.22)	260 (10.22)	273 (10.73)	291 (11.44)	309 (12.15)	319 (12.54)	345 (13.56)	374 (14.70)
	Weight kg (lb)			4.4 (9.7)	4.2 (9.3)	) 4.3	4.6 (10.1)	5.3 (11.7)	6.5 (14.3)	7.4 (16.3)	9.8 (21.6)	13.8 (30.4)

*1: When indicator code N is selected, subtract 12 mm (0.47 in) from the value in the figure.



Adapter for clamp connection

Process Connection	HAB (Tri–Clamp)							HDB (DIN 32676 Clamp)									HKB (ISO 2852 Clamp)								
Nominal Size	15	25	40	50	65	80	100	15	25	32	40	50	65	80	100	125	15	25	32	40	50	65	80	100	125
øA	70 (2.76)	70 (2.76)	83 (3.27)	96 (3.78)	114 (4.49)	126 (4.96)	152 (5.98)	70 (2.76)	70 (2.76)	70 (2.76)	83 (3.27)	96 (3.78)	114 (4.49)	126 (4.96)	152 (5.98)	180 (7.09)	70 (2.76)	70 (2.76)	70 (2.76)	83 (3.27)	96 (3.78)	114 (4.49)	126 (4.96)	152 (5.98)	180 (7.09)
øB	16 (0.63)	22.2 (0.87)	34.6 (1.36)	47.6 (1.87)	59.5 (2.34)	72.3 (2.85)	97 (3.82)	16 (0.63)	22.2 (0.87)	29.4 (1.16)	34.6 (1.36)	47.6 (1.87)	59.5 (2.34)	72.3 (2.85)	97 (3.82)	123 (4.84)	16 (0.63)	22.2 (0.87)	29.4 (1.16)	34.6 (1.36)	47.6 (1.87)	59.5 (2.34)	72.3 (2.85)	97 (3.82)	123 (4.84)
øC	19.2 (0.76)	25.4 (1.00)	38.1 (1.50)	50.8 (2.00)	63.5 (2.50)	76.2 (3.00)	101.6 (4.00)	20 (0.79)	30 (1.18)	36 (1.42)	42 (1.56)	54 (2.13)	70 (2.76)	85 (3.35)	104 (4.09)	129 (5.08)	18 (0.71)	25.6 (1.01)	34.3 (1.35)	38.6 (1.52)	51.6 (2.03)	64.1 (2.52)	76.7 (3.02)	102.5 (4.04)	141.2 (5.56)
ød	15.7 (0.62)	22.1 (0.87)	34.8 (1.37)	47.5 (1.87)	60.2 (2.37)	72.9 (2.87)	97.4 (3.83)	16 (0.63)	26 (1.02)	32 (1.26)	38 (1.50)	50 (1.97)	66 (2.60)	81 (3.19)	100 (3.94)	125 (4.92)	15.2 (0.60)	22.6 (0.89)	31.3 (1.23)	35.6 (1.40)	48.6 (1.91)	60.3 (2.37)	72.9 (2.87)	97.6 (3.84)	135.7 (5.34)
øE	--- ---	43.6 (1.72)	43.6 (1.72)	56.3 (2.22)	70.6 (2.78)	83.3 (3.28)	110.3 (4.34)	27.5 (1.08)	43.5 (1.71)	43.5 (1.71)	43.5 (1.71)	56.5 (2.22)	83.5 (3.29)	97 (3.82)	110 (4.33)	146 (5.75)	27.5 (1.08)	43.5 (1.71)	43.5 (1.71)	43.5 (1.71)	56.5 (2.22)	70.5 (2.78)	83.5 (3.29)	110 (4.33)	146 (5.75)
øF	25 (0.98)	50.4 (1.98)	50.4 (1.98)	64 (2.52)	77.4 (3.05)	91 (3.58)	118.9 (4.68)	34 (1.34)	50.5 (1.99)	50.5 (1.99)	50.5 (1.99)	64 (2.52)	91 (3.58)	106 (4.17)	119 (4.69)	155 (6.10)	34 (1.34)	50.5 (1.99)	50.5 (1.99)	50.5 (1.99)	64 (2.52)	77.5 (3.05)	91 (3.58)	119 (4.69)	155 (6.10)
G	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	60 (2.36)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	60 (2.36)
Parts No.	F9811 HU	F9811 HV	F9811 HX	F9811 HY	F9811 HZ	F9811 JA	F9811 JB	F9811 JD	F9811 JE	F9811 JF	F9811 JG	F9811 JH	F9811 JJ	F9811 JK	F9811 JL	F9811 JM	F9811 JN	F9811 JP	F9811 JQ	F9811 JR	F9811 JS	F9811 JT	F9811 JU	F9811 JV	F9811 JW

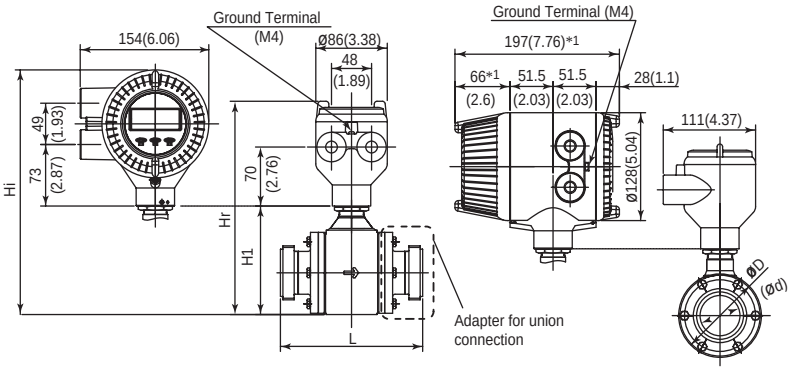
F34.EPS

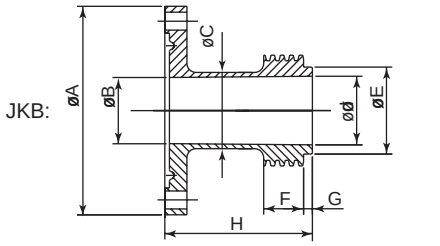
AXF Standard, AXF015-AXF125, Sanitary for Union Connection, PFA Lining

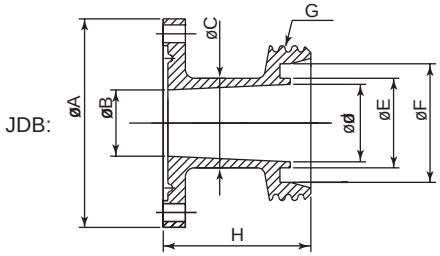
Unit: mm (approx. in)

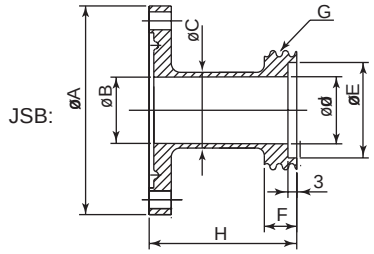
Integral Flowmeter **Remote Flowtube** **Integral Flowmeter** **Remote Flowtube**

AXF025											
AXF032		D									
AXF040		E	1					J	K	B	
AXF050	H	F	2	A	L	1	N	J	D	B	1
AXF065		N	N					J	S	B	
AXF080		P									
AXF100											









Adapters for union connection

Model												
Process Connection				JKB (ISO2853 Union) / JDB (DIN 11851 Union) / JSB (SMS1145 Union)								
Size code				015	025	032	040	050	065	080	100	125
Size				15 (0.5)	25 (1)	32 (1.3)	40 (1.5)	50 (2)	65 (2.6)	80 (3)	100 (4)	125 (5)
Lining code				A	A	A	A	A	A	A	A	A
Remote flowtube / Integral flowmeter	Face-to-face length	L $^{0}_{-3}$	JKB	166 (6.55)	166 (6.55)	166 (6.55)	166 (6.55)	176 (6.94)	196 (7.73)	216 (8.52)	246 (9.70)	–
			JDB	166 (6.55)	166 (6.55)	166 (6.55)	166 (6.55)	176 (6.94)	196 (7.73)	236 (9.31)	266 (10.49)	326 (12.85)
			JSB	–	166 (6.55)	166 (6.55)	166 (6.55)	176 (6.94)	196 (7.73)	216 (8.52)	276 (10.88)	–
	Outside dia.	ØD		73 (2.87)	73 (2.87)	73 (2.87)	86 (3.39)	99 (3.90)	117 (4.61)	129 (5.08)	155 (6.10)	183 (7.20)
	Inside dia.	Ød	JKB	15.2 (0.60)	22.6 (0.89)	31.3 (1.23)	35.6 (1.40)	48.6 (1.91)	60.3 (2.37)	72.9 (2.87)	97.6 (3.84)	–
			JDB	16 (0.63)	26 (1.02)	32 (1.26)	38 (1.50)	50 (1.97)	66 (2.60)	81 (3.19)	100 (3.94)	125 (4.92)
			JSB	–	22.5 (0.89)	29.6 (1.17)	35.5 (1.40)	48.5 (1.91)	60.5 (2.38)	72.9 (2.87)	97.6 (3.84)	–
	Height	H1		98 (3.86)	98 (3.86)	98 (3.86)	111 (4.37)	129 (5.08)	147 (5.79)	157 (6.18)	183 (7.20)	212 (8.35)
Remote flowtube	Max. Height	Hr		222 (8.74)	222 (8.74)	222 (8.74)	235 (9.25)	253 (9.96)	271 (10.67)	281 (11.06)	307 (12.09)	336 (13.23)
	Weight kg (lb)			2.6 (5.7)	2.6 (5.7)	2.7 (6.0)	3 (6.6)	3.8 (8.4)	4.9 (10.8)	5.9 (13.0)	8.2 (18.1)	13 (28.7)
Integral flowmeter	Max. Height	Hi		260 (10.24)	260 (10.24)	260 (10.24)	273 (10.73)	291 (11.44)	309 (12.17)	319 (12.54)	345 (13.56)	374 (14.70)
	Weight kg (lb)			4.3 (9.5)	4.3 (9.5)	4.4 (9.7)	4.7 (10.4)	5.5 (12.1)	6.6 (14.6)	7.6 (16.8)	9.9 (21.8)	14.7 (32.4)

*1: When indicator code N is selected, subtract 12 mm (0.47 in) from the value in the figure.

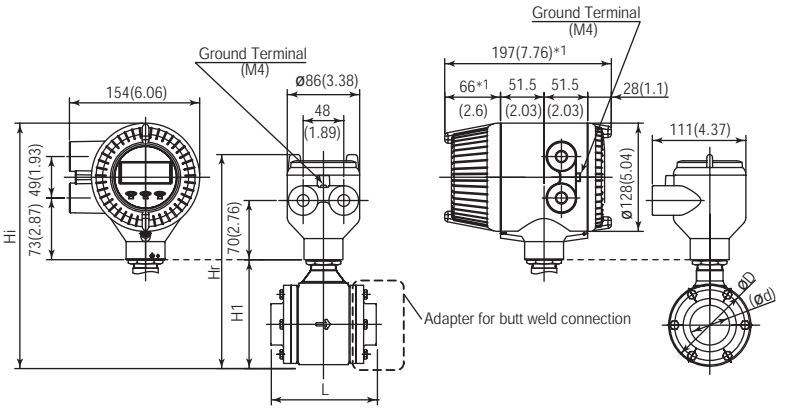
Process Connection	JKB (ISO 2853 Union)								JDB (DIN 11851 Union)									JSB (SMS1145 Union)						
Nominal Size	15	25	32	40	50	65	80	100	15	25	32	40	50	65	80	100	125	25	32	40	50	65	80	100
A	70 (2.76)	70 (2.76)	70 (2.76)	83 (3.27)	96 (3.78)	114 (4.49)	126 (4.96)	152 (5.98)	70 (2.76)	70 (2.76)	70 (2.76)	83 (3.27)	96 (3.78)	114 (4.49)	126 (4.96)	152 (5.98)	180 (7.09)	70 (2.76)	70 (2.76)	83 (3.27)	96 (3.78)	114 (4.49)	126 (4.96)	152 (5.98)
B	16 (0.63)	22.2 (0.87)	29.4 (1.16)	34.6 (1.36)	47.6 (1.87)	59.5 (2.34)	72.3 (2.85)	97 (3.82)	16 (0.63)	22.2 (0.87)	29.4 (1.16)	34.6 (1.36)	47.6 (1.87)	59.5 (2.34)	72.3 (2.85)	97 (3.82)	123 (4.84)	22.2 (0.87)	29.4 (1.16)	34.6 (1.36)	47.6 (1.87)	59.5 (2.34)	72.3 (2.85)	97 (3.82)
C	18 (0.71)	25.6 (1.01)	34.3 (1.35)	38.6 (1.52)	51.6 (2.03)	64.1 (2.52)	76.7 (3.02)	102.5 (4.04)	20 (0.79)	30 (1.18)	36 (1.42)	42 (1.65)	54 (2.13)	70 (2.76)	85 (3.35)	104 (4.09)	129 (5.08)	25.4 (1.00)	32 (1.26)	38.1 (1.50)	51 (2.01)	63.5 (2.50)	76.2 (3.00)	102.5 (4.04)
d	15.2 (0.60)	22.6 (0.89)	31.3 (1.23)	35.6 (1.40)	48.6 (1.91)	60.3 (2.37)	72.9 (2.87)	97.6 (3.84)	16 (0.63)	26 (1.02)	32 (1.26)	38 (1.50)	50 (1.97)	66 (2.60)	81 (3.19)	100 (3.94)	125 (4.92)	22.5 (0.89)	29.6 (1.17)	35.5 (1.40)	48.5 (1.91)	60.5 (2.38)	72.9 (2.87)	97.6 (3.84)
E	21.2 (0.83)	29.2 (1.15)	38.2 (1.50)	42.7 (1.68)	56.2 (2.21)	69.9 (2.75)	82.6 (3.25)	108.7 (4.28)	18 (0.71)	30 (1.18)	36 (1.42)	42 (1.65)	54 (2.13)	71 (2.80)	85 (3.35)	104 (4.09)	130 (5.12)	32 (1.26)	40 (1.57)	48 (1.89)	61 (2.40)	73.5 (2.89)	86 (3.39)	120 (4.72)
F	13.5 (0.53)	13.5 (0.53)	13.5 (0.53)	13.5 (0.53)	13.5 (0.53)	13.5 (0.53)	13.5 (0.53)	13.5 (0.53)	25.8 (1.02)	39.8 (1.57)	45.8 (1.80)	51.8 (2.04)	63.8 (2.51)	80.8 (3.18)	94.8 (3.73)	113.8 (4.48)	141.8 (5.58)	11 (0.43)	13 (0.51)	15 (0.59)	15 (0.59)	19 (0.75)	19 (0.75)	30 (1.18)
G	3 (0.12)	3 (0.12)	3 (0.12)	3 (0.12)	3 (0.12)	3 (0.12)	3 (0.12)	3 (0.12)	RD34 ˝1/8²	RD52 ˝1/6²	RD58 ˝1/6²	RD65 ˝1/6²	RD78 ˝1/6²	RD95 ˝1/6²	RD110 ˝1/4²	RD130 ˝1/4²	RD160 ˝1/4²	RD40 ˝1/6²	RD48 ˝1/6²	RD60 ˝1/6²	RD70 ˝1/6²	RD85 ˝1/6²	RD98 ˝1/6²	RD132 ˝1/6²
H	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	60 (2.36)	60 (2.36)	65 (2.56)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	50 (1.97)	65 (2.56)
Parts No.	F9811 LA	F9811 LB	F9811 LC	F9811 LD	F9811 LE	F9811 LF	F9811 LG	F9811 LH	F9811 KR	F9811 KS	F9811 KT	F9811 KU	F9811 KV	F9811 KW	F9811 KX	F9811 KY	F9811 KZ	F9811 LK	F9811 LL	F9811 LM	F9811 LN	F9811 LP	F9811 LQ	F9811 LR

F35.EPS

AXF Standard, AXF015-AXF125, Sanitary for Butt Weld, PFA Lining

Unit: mm (approx. in)

Integral Flowmeter **Remote Flowtube** **Integral Flowmeter** **Remote Flowtube**

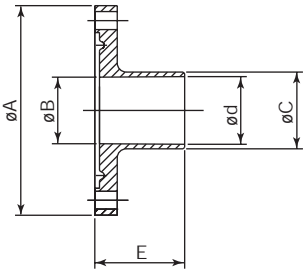


AXF015
AXF032
AXF040
AXF050
AXF065
AXF080
AXF100
AXF125

H — D E F N P 1 2 N N A L 1 N — K K B K D B 1

Model	Process Connection			KKB (ISO 2037 Butt Weld) / KDB (DIN 1185 Butt Weld)								
	Size code			015	025	032	040	050	065	080	100	125
	Size			15 (0.5)	25 (1)	32 (1.3)	40 (1.5)	50 (2)	65 (2.6)	80 (3)	100 (4)	125 (5)
	Lining code			A	A	A	A	A	A	A	A	A
Remote flowtube Integral flowmeter	Face-to-face length	L^{0}_{-3}		126 (4.98)	126 (4.98)	126 (4.98)	126 (4.98)	136 (5.37)	156 (6.16)	176 (6.94)	206 (8.13)	276 (10.88)
	Outside dia.	D		73 (2.87)	73 (2.87)	73 (2.87)	86 (3.39)	99 (3.90)	117 (4.61)	129 (5.08)	155 (6.10)	183 (7.20)
	Inner dia.	d	KKB	15.2 (0.60)	22.6 (0.89)	31.3 (1.23)	35.6 (1.40)	48.6 (1.91)	60.3 (2.37)	72.9 (2.87)	97.6 (3.84)	135.7 (5.34)
			KDB	16 (0.63)	26 (1.02)	32 (1.26)	38 (1.50)	50 (1.97)	66 (2.60)	81 (3.19)	100 (3.94)	125 (4.92)
	Height	H1		98 (3.86)	98 (3.86)	98 (3.86)	111 (4.37)	129 (5.08)	147 (5.79)	157 (6.18)	183 (7.20)	212 (8.35)
Remote flowtube	Max. Height	Hr		222 (8.74)	222 (8.74)	222 (8.74)	235 (9.25)	253 (9.96)	271 (10.67)	281 (11.06)	307 (12.09)	336 (13.23)
	Weight kg (lb)			2.6 (5.7)	2.3 (5.1)	2.5 (5.5)	2.8 (6.2)	3.4 (7.5)	4.5 (9.9)	5.3 (11.7)	7.1 (15.7)	11 (24.3)
Integral flowmeter	Max. Height	Hi		260 (10.24)	260 (10.24)	260 (10.24)	273 (10.73)	291 (11.44)	309 (12.17)	319 (12.54)	345 (13.56)	374 (14.70)
	Weight kg (lb)			4.3 (9.5)	4 (8.8)	4.2 (9.3)	4.5 (9.9)	5.1 (11.2)	6.2 (13.7)	7 (15.4)	8.8 (19.4)	12.7 (28.0)

*1: When indicator code N is selected, subtract 12 mm (0.47 in) from the value in the figure.



Adapter for butt weld connection

Process Connection	KKB (ISO 2037 Butt Weld)									KDB (DIN 1185 Butt Weld)								
Nominal Size	15	25	32	40	50	65	80	100	125	15	25	32	40	50	65	80	100	125
A	70 (2.76)	70 (2.76)	70 (2.76)	83 (3.27)	96 (3.78)	114 (4.49)	126 (4.96)	152 (5.98)	180 (7.09)	70 (2.76)	70 (2.76)	70 (2.76)	83 (3.27)	96 (3.78)	114 (4.49)	126 (4.96)	152 (5.98)	180 (7.09)
B	16 (0.63)	22.2 (0.87)	29.4 (1.16)	34.6 (1.36)	47.6 (1.87)	59.5 (2.34)	72.3 (2.85)	97 (3.82)	123 (4.84)	16 (0.63)	22.2 (0.87)	29.4 (1.16)	34.6 (1.36)	47.6 (1.87)	59.5 (2.34)	72.3 (2.85)	97 (3.82)	123 (4.84)
C	18 (0.71)	25.6 (1.01)	34.3 (1.35)	38.6 (1.52)	51.6 (2.03)	64.1 (2.52)	76.7 (3.02)	102.5 (4.04)	141.2 (5.56)	20 (0.79)	30 (1.18)	36 (1.42)	42 (1.65)	54 (2.13)	70 (2.76)	85 (3.35)	104 (4.09)	129 (5.08)
d	15.2 (0.60)	22.6 (0.89)	31.3 (1.23)	35.6 (1.40)	48.6 (1.91)	60.3 (2.37)	72.9 (2.87)	97.6 (3.84)	135.7 (5.34)	16 (0.63)	26 (1.02)	32 (1.26)	38 (1.50)	50 (1.97)	66 (2.60)	81 (3.19)	100 (3.94)	125 (4.92)
E	30 (1.18)	30 (1.18)	30 (1.18)	30 (1.18)	30 (1.18)	30 (1.18)	30 (1.18)	30 (1.18)	40 (1.57)	30 (1.18)	30 (1.18)	30 (1.18)	30 (1.18)	30 (1.18)	30 (1.18)	30 (1.18)	30 (1.18)	40 (1.57)
Parts No.	F9811 NN	F9811 NP	F9811 NQ	F9811 NR	F9811 NS	F9811 NT	F9811 NU	F9811 NV	F9811 NW	F9811 ND	F9811 NE	F9811 NF	F9811 NG	F9811 NH	F9811 NJ	F9811 NK	F9811 NL	F9811 NM

F36.EPS

Dimensions and special informations for Replacement Models for earlier ADMAG or ADMAG AE

Overview About Sizes, Styles and Options (Lay length code 2)

Unit: mm (in.)

Use	Process Connection	Lining	Remote Flowtube	Integral Flowmeter	High Grade Accuracy 0.2% of Rate	Enhanced Dual Frequency Excitation (Optional code HF1,HF2)	Replaceable Electrode (Electrode structure code 2)
General-purpose use	Wafer (*6)	PFA	2.5 (0.1), 5 (0.2), 10 (0.4), 15 (0.5), 25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)		—	25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)	—
		Polyurethane rubber	25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100(4.0), 150 (6.0), 200(8.0)		—	25 (1.0), 40(1.5), 50 (2.0), 80(3.0), 100 (4.0), 150 (6.0), 200 (8.0)	—
	Flange (*7)	PFA	150 (6.0), 200 (8.0), 250 (10)		—	150 (6.0), 200 (8.0)	150 (6.0), 200 (8.0), 250 (10)
		Polyurethane rubber	150 (6.0), 200 (8.0), 250 (10)		—	150 (6.0), 200 (8.0)	150 (6.0), 200 (8.0), 250 (10)
Submersible Type	Wafer (*6)	PFA	15 (0.5), 25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)	—	—	25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)	—
		Polyurethane rubber	25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)	—	—	25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)	—
	Flange (*7)	PFA	150 (6.0), 200 (8.0), 250(10)	—	—	150 (6.0), 200 (8.0)	—
		Polyurethane rubber	150 (6.0), 200 (8.0), 250 (10)	—	—	150 (6.0), 200 (8.0)	—
Explosion proof Type	Wafer (*6)	PFA	2.5 (0.1), 5 (0.2), 10 (0.4), 15 (0.5), 25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)		—	25 (1.0), 40 (1.5), 50 (2.0), 80 (3.0), 100 (4.0), 150 (6.0), 200 (8.0)	—
	Flange (*7)	PFA	150 (6.0), 200 (8.0), 250 (10)		—	150 (6.0), 200 (8.0)	—

T22.EPS

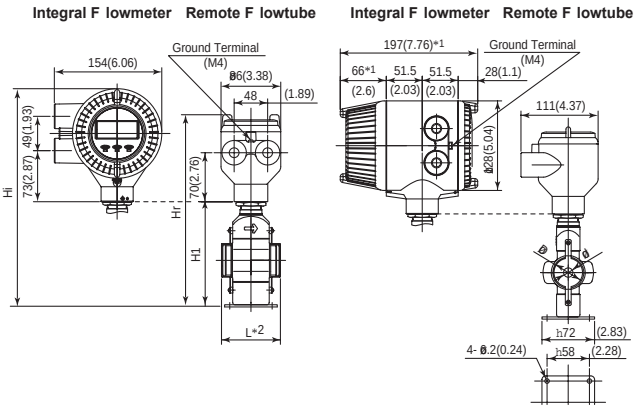
*6: ADMAG lay length dimensions for wafer type of 250 mm (10 in.), and 300 mm (12 in.) are the same as those for AXF Standard. And, in case of “platinum-iridium (grounding ring code P) or tantalum (grounding ring code T) or None (grounding ring code N)” in wafer type of 2.5 mm (0.1 in.) to 15 mm (0.5 in.), the lay lengths of Replacement model are the same as those for AXF Standard.

*7: ADMAG lay length dimensions for flange type of 15 mm (0.5 in.) to 100 mm (4.0 in.), or 300 mm (12 in.) to 2600 mm (104 in.) are the same as those for AXF Standard. However, in case of platinum-iridium (grounding ring code P) or tantalum (grounding ring code T) or None (grounding ring code N) in flange type of 15 mm (0.5 in.) to 100 mm (4.0 in.), the lay length of AXF Standard are longer by approx. 4mm (0.16 in) than those of earlier ADMAG or ADMAG AE.

Replacement model for Earlier ADMAG or ADMAG AE, AXF002-AXF015, Wafer Style/ PFA Lining

Unit : mm (approx. inch)

AXF002 AXF005 AXF010 AXF015 — G W C — D E F N P — 1 2 N — A □ 1 □ — A □ □ 2



Model	Size code		002	005	010	015
	Size		2.5(0.1)	5(0.2)	10(0.4)	15(0.5)
	Lining code		A	A	A	A
Remote flowtube / Integral flowmeter	Face-to-face length	L^{0}_{-3}*2	85(3.35)			
	Outside dia.	øD	44(1.74)			
	Inner diameter of Grounding ring	øø	15(0.59)			
	Height	H1	141(5.55)			
Remote flowtube	Max. Height	Hr	265(10.43)			
	Weight kg (lb)*3		2.4(5.3)			
Integral flowmeter	Max. Height	Hi	306(12.03)			
	Weight kg (lb) *3		4.1(9.0)			

*1: When indicator code N is selected, subtract 12 mm (0.47 inch) from the value in the figure.
For explosion proof style with indicator add 5mm (0.2inch) to it.

*2: Depending on the selection of grounding ring code and optional

Grounding Ring Code		S, L, H, V	P, T	N
Option Code	None	+0	+22(0.87)	-6(0.24)
	GA, GC, GD (Special Gaskets)	+2(0.08)	+24(0.94)	–

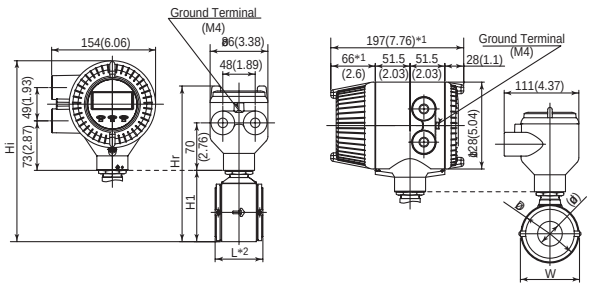
*3: Waterproof glands and a 30 m long cable are attached to each submersible style flowtube. Add 9.5 kg (20.9 lb) to the weight in the table.

F37.EPS

Replacement model for Earlier ADMAG or ADMAG AE, AXF025-AXF100, Wafer Type, PFA / Polyurethane Rubber Lining

Unit : mm (approx. inch)

AXF025 AXF040 AXF050 AXF080 AXF100 — G W C — D E F N P — 1 2 N — A U □ 1 □ — A □ □ 2



Model	Size code		025	040	050	080	100
	Size		25(1)	40(1.5)	50(2)	80(3)	100(4)
	Lining code		A,U	A,U	A,U	A,U	A,U
Remote flowtube / Integral flowmeter	Face-to-face length	L^{0}_{-3}*2	93(3.66)	106(4.17)	120(4.72)	160(6.30)	180(7.09)
	Outside dia.	øD	67.5(2.66)	86(3.39)	99(3.90)	129(5.08)	155(6.10)
	Inner diameter of Grounding ring	øø	27(1.06)	40(1.57)	52(2.05)	81(3.19)	98(3.86)
	Width	W	67.5(2.66)	86(3.39)	99(3.90)	129(5.08)	155(6.10)
	Height	H1	92(3.62)	111(4.37)	129(5.08)	157(6.18)	183(7.20)
Remote flowtube	Max. Height	Hr	216(8.50)	235(9.25)	253(9.96)	281(11.06)	307(12.09)
	Weight kg (lb)*3		3.1(6.7)	3.5(7.7)	4.2(9.3)	6.4(14.1)	8.0(17.6)
Integral flowmeter	Max. Height	Hi	254(9.98)	273(10.73)	291(11.44)	319(12.54)	345(13.56)
	Weight kg (lb)		4.0(8.7)	4.6(10.1)	5.2(11.4)	7.5(16.6)	9.6(21.1)

*1: When indicator code N is selected, subtract 12 mm (0.47 inch) from the value in the figure.
For explosion proof style with indicator add 5mm (0.2inch) to it.

*2: Depending on the selection of grounding ring code and

Grounding Ring Code		S, L, H, V	P, T	N
Option Code	None	+0	+22(0.87)	-6(0.24)
	GA, GC, GD (Special Gaskets)	+2(0.08)	+24(0.94)	–

*3: Waterproof glands and a 30 m long cable are attached to each submersible style flowtube. Add 9.5 kg (20.9 lb) to the weight in the table.

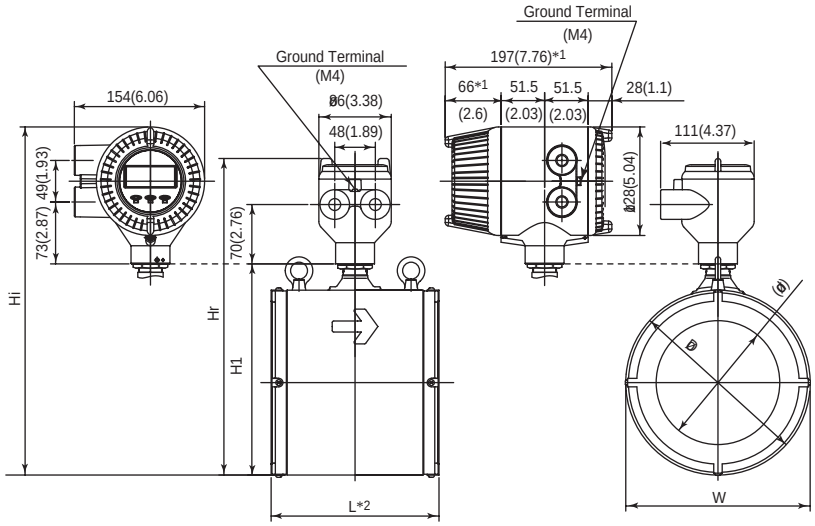
F38.EPS

Replacement model for Earlier ADMAG or ADMAG AE, AXF150, AXF200, Wafer Style, PFA / Polyurethane Rubber Lining

Unit : mm (approx. inch)

AXF150 AXF200 **G W C** — **D E F N P** **1 2 N** **A U** □ **1** □ — **A** □ □ **2**

Integral flowmeter **Remote flowtube** **Integral flowmeter** **Remote flowtube**



Model	Size code		150	200
	Size		150(6)	200(8)
	Lining code		A,U	A,U
Remote flowtube / Integral flowmeter	Face-to-face length	L^{0}_{-3} *2	230(9.06)	300(11.81)
	Outside dia.	ØDØ	202(7.95)	252(9.92)
	Inner diameter of Grounding ring	Ød	140.7(5.54)	188.9(7.44)
	Width	W	202(7.95)	252(9.92)
	Height	H1	243(9.57)	293(11.54)
Remote flowtube	Max. Height	Hr	367(14.45)	417(16.42)
	Weight kg (lb)*3		17.9(39.5)	26.8(59.1)
Integral flowmeter	Max. Height	Hi	405(15.93)	455(17.89)
	Weight kg (lb)*3		19.6(43.2)	28.5(62.8)

*1: When indicator code N is selected, subtract 12 mm (0.47 inch) from the value in the figure.
For explosion proof style with indicator add 5mm (0.2inch) to it.

*2: Depending on the selection of grounding ring code and optional code, add

Grounding Ring Code		S, L, H, V	P, T	N
Option Code	None	+0	+28(1.1)	-6(0.24)
	GA, GC, GD (Special Gaskets)	+2(0.08)	+30(1.18)	–

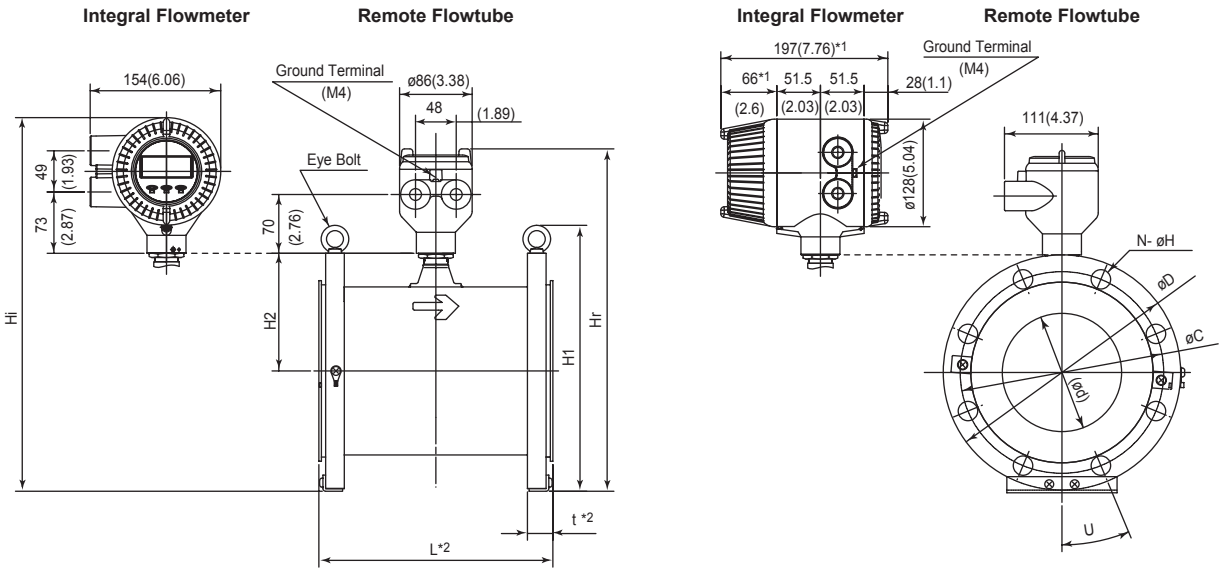
*3: Waterproof glands and a 30 m long cable are attached to each submersible style flowtube. Add 9.5 kg (20.9 lb) to the weight in the table.

F39.EPS

Replacement model for Earlier ADMAG or ADMAG AE, AXF150-AXF250, PFA/ Polyurethane Rubber Lining

AXF150 G
AXF200W — D E 1 A □ 1 □ — C A □ 2
AXF250 C F 2 U 2 C D □ 2
N
P

Unit : mm (approx. inch)



Model	Process Connection		CA1(ANSI Class 150)			CA2(ANSI Class 300)			CD1(DIN PN10)		CD2(DIN PN16)		
	Size code		150	200	250	150	200	250	200	250	150	200	250
	Size		150 (6)	200 (8)	250 (10)	150 (6)	200 (8)	250 (10)	200 (8)	250 (10)	150 (6)	200 (8)	250 (10)
	Lining code		A,U	A,U	A,U	A,U	A,U	A,U	A,U	A,U	A,U	A,U	A,U
Remote flowtube Integral flow meter	Face-to-face length	L*2	270 0 -3 (10.63)	340 0 -3 (13.39)	430 0 -3 (16.93)	270 0 -3 (10.63)	340 0 -3 (13.39)	430 0 -3 (16.93)	340 0 -3 (13.39)	430 0 -5 (16.93)	270 0 -3 (10.63)	340 0 -3 (13.39)	430 0 -5 (16.93)
	Outside dia.	øD	279.4 (11.00)	342.9 (13.50)	406.4 (16.00)	317.5 (12.50)	381.0 (15.00)	444.5 (17.50)	340 (13.39)	395 (15.55)	285 (11.22)	340 (13.39)	405 (15.94)
	Thickness	t *2	32.4 (1.28)	35.4 (1.39)	38.2 (1.50)	45.5 (1.79)	48.1 (1.89)	55.7 (2.19)	31 (1.22)	34 (1.34)	29 (1.14)	31 (1.22)	34 (1.34)
	Inner diameter of Grounding ring	ød	140.7 (5.54)	188.9 (7.44)	243 (9.57)	140.7 (5.54)	188.9 (7.44)	243 (9.57)	188.9 (7.44)	243 (9.57)	140.7 (5.54)	188.9 (7.44)	243 (9.57)
	Pitch circle dia.	øC	241.3 (9.50)	298.5 (11.75)	362.0 (14.25)	269.7 (10.62)	330.2 (13.00)	387.4 (15.25)	295 (11.61)	350 (13.78)	240 (9.45)	295 (11.61)	355 (13.98)
	Bolt hole interval	u°	22.5	22.5	15	15	15	11.25	15	15	22.5	22.5	15
	Hole dia.	øh	22.4 (0.88)	22.4 (0.88)	25.4 (1.00)	22.4 (0.88)	25.4 (1.00)	28.4 (1.12)	23 (0.91)	23 (0.91)	23 (0.91)	23 (0.91)	28 (1.10)
	Number of holes	N	8	8	12	12	12	16	12	12	8	8	12
	Height	H1	318 (12.52)	368 (14.49)	451 (17.76)	330 (12.99)	378 (14.88)	466 (18.35)	373 (14.69)	449 (17.68)	320 (12.60)	373 (14.69)	454 (17.87)
	Height	H2	141 (5.55)	166 (6.54)	196 (7.72)	141 (5.55)	166 (6.54)	196 (7.72)	166 (6.54)	196 (7.72)	141 (5.55)	166 (6.54)	196 (7.72)
Remote flowtube	Max. Height	Hr	405 (15.93)	461 (18.17)	523 (20.60)	424 (16.68)	481 (18.92)	542 (21.35)	460 (18.11)	518 (20.37)	408 (16.04)	460 (18.11)	523 (20.57)
	Weight kg (lb)*3		32.1 (70.7)	50.9 (112.2)	77.4 (170.6)	53.7 (118.4)	80.5 (177.5)	127.0 (279.9)	44.2 (97.5)	67.0 (147.7)	29.9 (65.8)	43.6 (96.2)	68.8 (151.7)
Integral flow meter	Max. Height	Hi	442 (17.41)	499 (19.64)	561 (22.07)	461 (18.16)	518 (20.39)	580 (22.82)	498 (19.59)	555 (21.85)	445 (17.52)	498 (19.59)	560 (22.05)
	Weight kg (lb)		33.8 (74.4)	52.6 (115.9)	79.1 (174.4)	55.4 (122.1)	82.2 (181.2)	128.7 (283.6)	45.9 (101.2)	68.7 (151.5)	31.6 (69.6)	45.3 (100.0)	70.5 (155.5)

*1: When indicator suffix code N is selected, subtract 12 mm (0.47 inch) from the value in the figure.
For explosion proof style with indicator add 5mm (0.2inch) to it.

*2: Depending on the selection of grounding ring code and optional code, add the following value to "L" (face-to-face length) and "t" (thickness of

Nominal Size: 150, 200 mm							
		L	t	L	t	L	t
Grounding Ring Code		S, L, H, V		P, T		N	
Option Code	None	+0	+0	+28(1.10)	+14(0.55)	-6(0.24)	-3(0.12)
	GA, GC, GD (Special Gaskets)	+2(0.08)	+1(0.04)	+30(1.18)	+15(0.59)	–	–

Nominal Size: 250 mm				
	L	t	L	t
Grounding Ring Code	S, L, H, V		N	
Option Code is "None"	+0	+0	-6(0.24)	-3(0.12)

*3: Waterproof glands and a 30 m long cable are attached to each submersible type flowtube. Add 9.5 kg (20.9 lb) to the weight in the table.

F40.EPS

RECOMMENDED GASKETS BETWEEN FLOWTUBES AND USER'S FLANGES

Use compressed non-asbestos fiber gaskets, PTFE gaskets or gaskets which have equivalent elasticity. For optional codes GA, GC and GD use rubber gaskets or others which have equivalent elasticity (such as Teflon-coated rubber gaskets).

Unless otherwise specified, differences in the dimensions are refering to the following table.

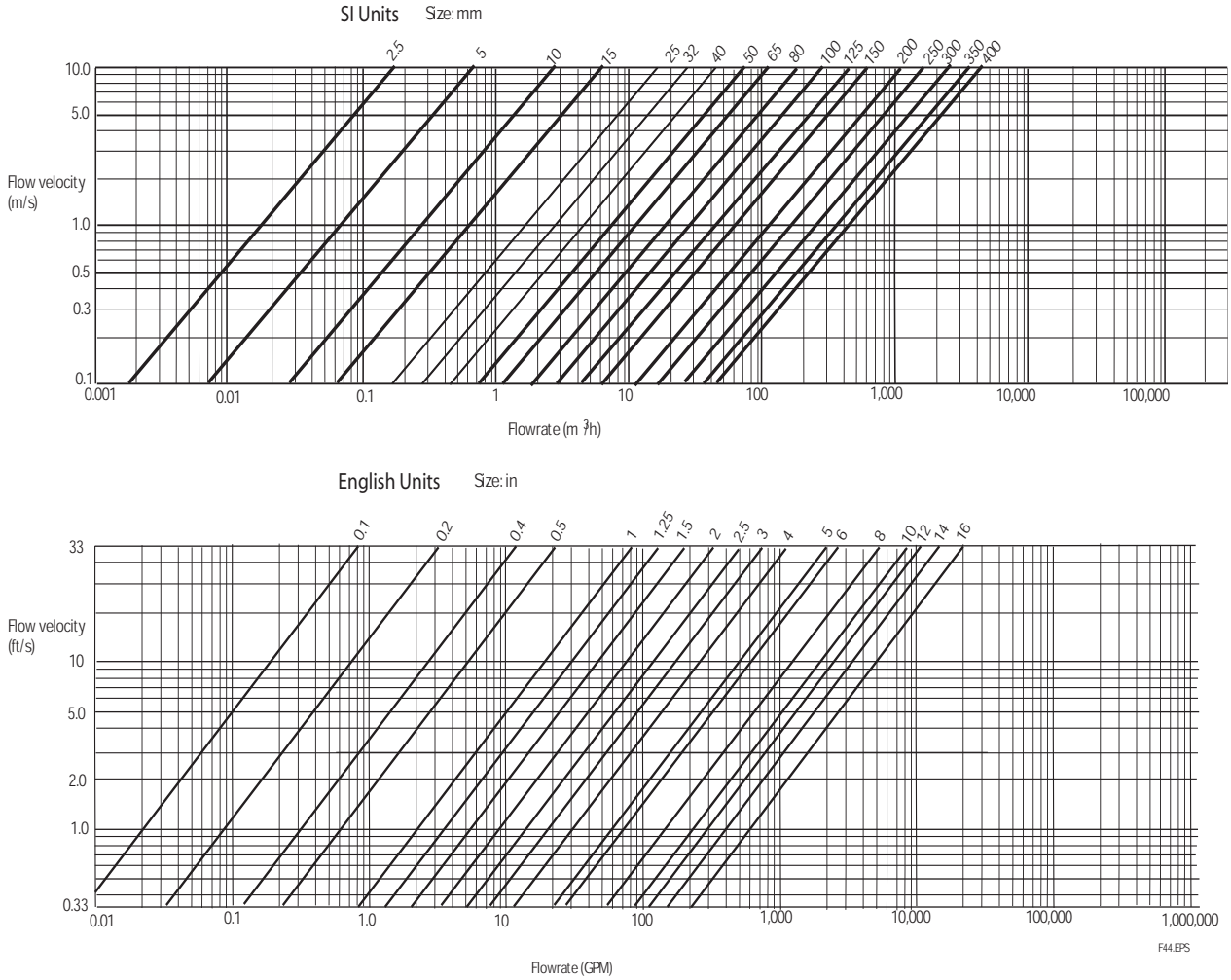
General tolerance in the dimensional outline drawing.

Unit : mm (approx.inch)

Category of basic dimension		Tolerance
Above	Equal or below	
	3 (0.12)	±0.7 (60.03)
3 (0.12)	6 (0.24)	±0.9 (60.04)
6 (0.24)	10 (0.39)	±1.1 (60.04)
10 (0.39)	18 (0.71)	±1.35 (60.05)
18 (0.71)	30 (1.18)	±1.65 (60.06)
30 (1.18)	50 (1.97)	±1.95 (60.08)
50 (1.97)	80 (3.15)	±2.3 (60.09)
80 (3.15)	120 (4.72)	±2.7 (60.11)
120 (4.72)	180 (7.09)	±3.15 (60.12)
180 (7.09)	250 (9.84)	±3.6 (60.14)
250 (9.84)	315 (12.40)	±4.05 (60.16)
315 (12.40)	400 (15.75)	±4.45 (60.18)
400 (15.75)	500 (19.69)	±4.85 (60.19)

Remarks: The numeric is based on criteria of tolerance class IT18 in JIS B 0401.

SIZING DATA (Measurable flow velocity is from 0 m/s.)



7. PED (PRESSURE EQUIPMENT DIRECTIVE)

This chapter describes further requirements and notices concerning the PED (Pressure Equipment Directive). The description in this chapter is prior to other description in this User's Manual.

(1) Technical Data

Module: H
Type of Equipment: Piping
Type of Fluid: Liquids and gas
Group of Fluid: 1 and 2 (*1)

General Purpose / Submersible Style / Explosion Proof Style

MODEL	DN (mm) (*2)	PS (MPa) (*2)	PS DN (MPa · mm)	CATEGORY(*3)
AXF002G/C	2.5	4	10	Article 3, (*4) paragraph 3
AXF005G/C	5	4	20	Article 3, (*4) paragraph 3
AXF010G/C	10	4	40	Article 3, (*4) paragraph 3
AXF015G/W/C	15	4	60	Article 3, (*4) paragraph 3
AXF025G/W/C	25	4	100	Article 3, (*4) paragraph 3
AXF032G/W/C	32	4	128	II
AXF040G/W/C	40	4	160	II
AXF050G/W/C	50	4	200	II
AXF065G/W/C	65	2	130	II
AXF080G/W/C	80	2	160	II
AXF100G/W/C	100	2	200	II
AXF125G/W/C	125	2	250	II
AXF150G/W/C	150	2	300	II
AXF200G/W/C	200	2	400	III
AXF250G/W/C	250	2	500	III
AXF300G/W/C	300	2	600	III
AXF350G/W/C	350	1	350	II
AXF400G/W/C	400	1	400	III

T0701.EPS

Sanitary Style

MODEL	DN (mm) (*2)	PS (MPa) (*2)	PS D (MPa · mm)	CATEGORY (*3)
AXF015H	15	1	15	Article 3, (*4) paragraph 3
AXF025H	25	1	25	Article 3, (*4) paragraph 3
AXF032H	32	1	32	I
AXF040H	40	1	40	I
AXF050H	50	1	50	I
AXF065H	65	1	65	I
AXF080H	80	1	80	I
AXF100H	100	1	100	I
AXF125H	125	1	125	II

T0702.EPS

Note : The sizes of 500 to 2600 mm (20 to 104 in.) are not attached CE marking of PED.

*1: The usage of fluids is in general limited by the corrosion resistance of the wetted parts. Please refer to TI 01E06A0-06E for the corrosion resistance of lining, electrode, grounding ring/ electrode, and gasket material in reference to the measured media.
For fluid group 2 with a max. partial pressure of 1.5bar at $T_{max.}$.

*2: PS: Maximum allowable pressure for Flowtube
DN: Nominal size

*3: For details, see "Table 6 covered by ANNEX II of EC Directive on Pressure Equipment Directive 97/23 EC."

*4: AXF002G/C to AXF025G/W/C, AXF015H and AXF025H are outside the scope of CE marking of PED.

(2) Installation

WARNING

- Tighten the bolts of the piping joints according to the prescribed torque values.
- Take measures to protect the flowmeters from forces caused by vibration channeled through the piping.

(3) Operation

WARNING

- The instrument should be operated with the temperature and pressure of the fluid under normal operating conditions.
- The ambient temperature should be that of normal operating conditions.
- Take measures to prevent excessive pressure such as water hammer, etc. To avoid water hammer prevent the pressure from exceeding the PS (maximum allowable pressure) by setting the system's safety valves, etc. appropriately.
- Should external fire occur, take safety measures at the device itself or system-wide prevent it having an effect on the flowmeters.
- Avoid using fluids exceeding the corrosion proof limitations of the lining and electrodes.
- Take measures not to abrade the metal pipe, and avoid abrading the lining by using fluids such as slurry and sand are contained.

WARNING

The operator is responsible that no corrosion and/or erosion is caused by the medium, which reduces the safety of the unit as pressure vessel. Corrosion and erosion can make the unit fail and can lead to the endangering of persons and facilities. If corrosion and erosion are possible, the integrity of the tubes has to be checked periodically.

8. HAZARDOUS DUTY TYPE INSTRUMENT

In this section, further requirements and differences for explosion proof type instrument are described. For explosion proof type instrument, the description in this chapter is prior to other description in this user's manual.

WARNING

- Magnetic flowmeters with the model name AXF□□□C are products which have been certified as explosion proof type instruments. Strict limitations are applied to the structures, installation locations, external wiring work, maintenance and repairs, etc. of these instruments. Sufficient care must be taken, as any violation of the limitations may cause dangerous situations.
  Be sure to read this chapter before handling the instruments.
  For explosion proof type instrument, the description in this chapter is prior to other description in this user's manual.

WARNING

The terminal box cover and display cover is locked by special screw. In case of opening the cover, please use the hexagonal wrench attached.
The covers of explosion proof type products are locked. Use the attached hexagonal wrench to open and close the cover. Before opening the cover, be sure to check that the power of flowmeter has been turned off. Once the cover is closed, be sure to re-lock the product.
Be sure to lock the cover with the special screw using the hexagonal wrench attached after tightening the cover.

8.1 ATEX (KEMA)

WARNING

Only trained persons use this instrument in industrial locations.

(1) Technical Data

*AXF002C – AXF400C
Applicable Standard:
EN 50014, EN 50018, EN 50019,
EN 50020, EN 50028, EN 50281-1-1,
EN 60529, EN 61010-1
Certificate: KEMA 03ATEX2435

(Integral Flowmeter)
ATEX (KEMA) Flame proof Type
Group: II
Category: 2G
EEx dme [ia] IIC T6...T3
Electrode Circuit Um: 250 Vac/dc
Maximum power supply voltage: 250 Vac/130 Vdc
Excitation Circuit: 140V max
Enclosure: IP66, IP67
Temperature Class:

Temperature Class	Maximum Process Temperature	Minimum Process Temperature
T6	+70°C (+158°F)	–40°C (–40°F)
T5	+85°C (+185°F)	–40°C (–40°F)
T4	+120°C (+248°F)	–40°C (–40°F)
T3	+130°C (+266°F)	–40°C (–40°F)

T0801.EPS

Ambient Temp.: –40°C to +60°C (–40°F to +140°F)

ATEX (KEMA) Type of Protection "Dust"
Group: II
Category: 1D
Electrode Circuit Um: 250 Vac/dc
Maximum Power Supply Voltage: 250 Vac/130 Vdc
Excitation Circuit: 140V max
Enclosure: IP66, IP67

IM 01R20D01-01E-E
3rd edition, Nov. 2006

Maximum surface temperature:

Maximum Surface Temperature	Maximum Process Temperature
T75°C (+167°F)	+70°C (+158°F)
T85°C (+185°F)	+85°C (+185°F)
T100°C (+212°F)	+120°C (+248°F)
T110°C (+230°F)	+130°C (+266°F)

T0802.EPS

Ambient Temp.:–40°C to +60°C (–40°F to +140°F)

(Remote Flowtube)
CENELEC ATEX (KEMA) Flame proof Type

Group category: II 2G
EEx dme [ia] IIC T6...T3
Electrode Circuit Um: 250 Vac/dc
Excitation Circuit: 170V max
Enclosure: IP66, IP67
Temperature Class:

Temperature Class	Maximum Process Temperature	Minimum Process Temperature
T6	+70°C (+158°F)	–40°C (–40°F)
T5	+85°C (+185°F)	–40°C (–40°F)
T4	+120°C (+248°F)	–40°C (–40°F)
T3	+150°C (+302°F)	–40°C (–40°F)

T0803.EPS

Ambient Temp.: –40°C to +60°C (–40°F to +140°F)

CENELEC ATEX (KEMA) Type of Protection "Dust"

Group: II
Category: 1D
Electrode Circuit Um: 250 Vac/dc
Excitation Circuit: 170V max
Enclosure: IP66, IP67
Maximum surface temperature:

Maximum Surface Temperature	Maximum Process Temperature
T75°C (+167°F)	+70°C (+158°F)
T85°C (+185°F)	+85°C (+185°F)
T100°C (+212°F)	+120°C (+248°F)
T115°C (+239°F)	+150°C (+302°F)

T0804.EPS

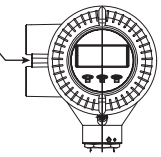
Ambient Temp.: –40°C to +60°C (–40°F to +140°F)

(2) Electrical Connection

The type of electrical connection is stamped near the electrical connection port accordiing to the following codes.

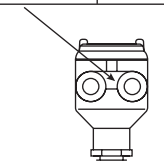
(Integral Flowmeter)

Screw Size	Marking
ISO M20x1.5 female	⚠ M
ANSI 1/2NPT female	⚠ A



(Remote Flowtube)

Screw Size	Marking
ISO M20x1.5 female	⚠ M
ANSI 1/2NPT female	⚠ A



F0801.EPS

(3) Installation

WARNING

- All wiring shall comply with local installation requirements and local electrical code.
- In hazadous locations, the cable entry devices shall be of a certified ATEX flame proof type, suitable for the conditions of use and correctly installed.
- Unused apertures shall be closed with suitable flame proof certified blanking elements. (The plug attached is flame proof certified.)

(4) Operation

(Integral Flowmeter)

WARNING

- After de-energizing, delay 20 minutes before opening.
- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous locations.

(Remote Flowtube)

WARNING

- De-energize before opening.
- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous locations.

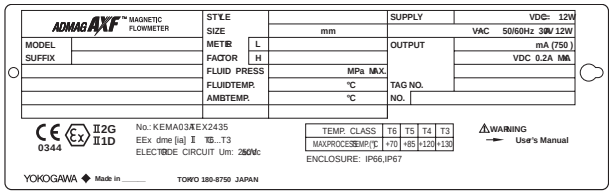
(5) Maintenance and Repair

WARNING

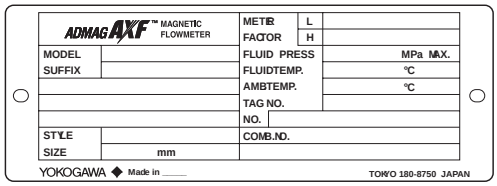
The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void the certification.

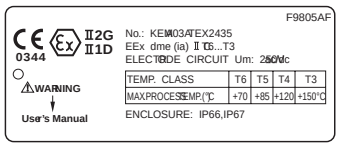
(6) Data Plate

(Integral Flowmeter)



(Remote Flowtube)





MODEL	:	Specified model code
SUFFIX	:	Suffix codes of the model code
STYLE	:	Specified style code
SIZE	:	Nominal size of apparatus
METER FACTOR	:	Sensor constant number of apparatus
SUPPLY	:	Power supply voltage of apparatus
OUTPUT	:	Output signal of apparatus
FLUID TEMP.	:	Fluid temperature of apparatus
FLUID PRESS	:	Fluid pressure of apparatus
AMB. TEMP., Tamb	:	Ambient temperature
No.	:	Manufacturing serial number *1)
CE	:	CE marking
II 2G	:	Group II Category 2 Gas atmosphere
II 1D	:	Group II Category 1 Dust atmosphere
No.	:	KEMA 03ATEX2435: EC Type Examination certificate number
EEx dme[ia]IIC T6...T3	:	Protection type and temp. class
ELECTRODE CIRCUIT Um	:	Voltage of electrode circuit
ENCLOSURE	:	Enclosure protection code

WARNING: Warning to apparatus
YOKOGAWA r TOKYO 180-8750 JAPAN : Name and address of manufacturer

*1) The third figure from the last shows the last one figure of the year of production. For example, the year of production of the product engraved as follows is year 2003.

No. F261GA091 313
↑
Produced in 2003

or the data plate indicates in a separate field "Produced 20□□"

*2) The identification number of the notified body : 0344 KEMA Netherland

*3) The product-producing country

*4) In case of the sizes of 2.5 to 25mm (0.1 to 1.0 in.) , "0038" is not described.

8.2 FM

(1) Technical Data

*AXF002C – AXF400C

Applicable Standard:
FM3600, FM3610, FM3615,
FM3810, ANSI/NEMA 250

(Integral Flowmeter)

Explosion proof for Class I, Division 1, Group A, B, C, & D.

Dust-ignition proof for Class II/III, Division1, Group E, F & G.

Intrinsically safe (electrodes) for Class I, Division 1, Group A, B, C, & D.

"SEAL ALL CONDUITS WITHIN 18 INCHES"

"WHEN INSTALLED IN DIV. 2, SEALS NOT REQUIRED"

Electrode Circuit Um: 250 Vac/dc

Maximum power supply voltage: 250 Vac/130 Vdc

Excitation Circuit: 140V max

Enclosure: NEMA 4X

Temperature Code: T6

Refer to following table:

Temperature Code	Maximum Process Temperature	Minimum Process Temperature
T6	+70°C (+158°F)	–40°C (–40°F)
T5	+85°C (+185°F)	–40°C (–40°F)
T4	+120°C (+248°F)	–40°C (–40°F)
T3	+130°C (+266°F)	–40°C (–40°F)

T0805.EPS

Ambient Temp.: –40°C to +60°C (–40°F to +140°F)

(Remote Flowtube)

Explosion proof for Class I, Division 1, Group A, B, C, & D.
Dust-ignition proof for Class II/III, Division1, Group E, F & G.
Intrinsically safe (electrodes) for Class I, Division 1, Group A, B, C, & D.
"SEAL ALL CONDUITS WITHIN 18 INCHES"
"WHEN INSTALLED IN DIV. 2, SEALS NOT REQUIRED"
Electrode Circuit Um: 250 Vac/dc
Excitation Circuit: 170V max
Enclosure: NEMA 4X
Temperature Code: T6
Refer to following table:

Temperature Code	Maximum Process Temperature	Minimum Process Temperature
T6	+70°C (+158°F)	–40°C (–40°F)
T5	+85°C (+185°F)	–40°C (–40°F)
T4	+120°C (+248°F)	–40°C (–40°F)
T3	+150°C (+302°F)	–40°C (–40°F)

T0806.EPS

Ambient Temp.: –40°C to +60°C (–40°F to +140°F)

(2) Installation

WARNING

- All wiring shall comply with National Electrical Code ANSI/NFPA 70 and Local Electrical Code.
- In hazardous locations, wiring to be in conduit as shown in Figure 8.2.1.
- When installed in Division 2, "SEALS NOT REQUIRED"

(3) Operation

WARNING

- "OPEN CIRCUIT BEFORE REMOVING COVERS."
- "SEALS ALL CONDUITS WITHIN 18 INCHES" in hazardous locations.
- When installed in Division 2, "SEALS NOT REQUIRED"
- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous locations.

(4) Maintenance and Repair

WARNING

The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void the approval of Factory Mutual Research Corporation.

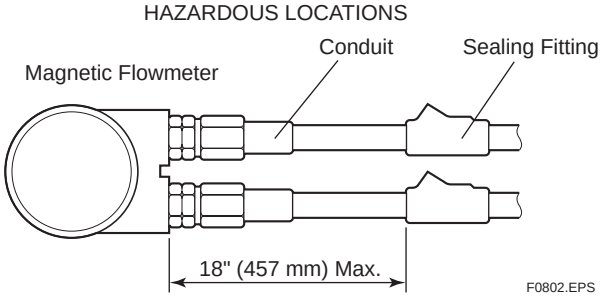


Figure 8.2.1 Conduit Wiring

8.3 CSA

(1) Technical Data

*AXF002C – AXF400C
Applicable Standard:
For CSA C22.2 Series;
C22.2 No 0, C22.2 No 0.4, C22.2 No 0.5, C22.2 No 25, C22.2 No 30, C22.2 No 94, C22.2 No 157, C22.2 No 1010.1
For CSA E79 Series;
CAN/CSA-E79-0, CAN/CSA-E79-1, CAN/CSA-E79-7, CAN/CSA-E79-11, CAN/CSA-E79-18
Certificate: 1481213

(Integral Flowmeter)
For CSA C22. 2 Series

Explosion proof for Class I, Division 1, Group A, B, C, & D.
Dust-ignition proof for Class II/III, Division 1, Group E, F & G.
Intrinsically safe (electrodes) for Class I, Division 1, Group A, B, C, & D.
"SEAL ALL CONDUITS WITHIN 50 cm OF THE ENCLOSURE"
"WHEN INSTALLED IN DIV. 2, SEALS NOT REQUIRED"
Electrode Circuit Um: 250 Vac/dc
Maximum Power Supply Voltage: 250 Vac/130 Vdc
Excitation Circuit: 140V max
Enclosure: Type 4X
Temperature Code:

Temperature Code	Maximum Process Temperature	Minimum Process Temperature
T6	+70°C (+158°F)	–40°C (–40°F)
T5	+85°C (+185°F)	–40°C (–40°F)
T4	+120°C (+248°F)	–40°C (–40°F)
T3	+130°C (+266°F)	–40°C (–40°F)

T27-1.EPS

Ambient Temp.: –40°C to +60°C (–40°F to +140°F)

For CSA E79 Series

Flame proof for Zone 1, Ex dme [ia] IIC T6...T3
Intrinsically safe (electrodes) for Zone 0, Ex ia IIC T6...T3

Electrode Circuit Um: 250 Vac/dc
Maximum Power Supply Voltage: 250 Vac/130 Vdc
Excitation Circuit: 140V max
Enclosure: Type 4X
Temperature Code:

Temperature Code	Maximum Process Temperature	Minimum Process Temperature
T6	+70°C (+158°F)	–40°C (–40°F)
T5	+85°C (+185°F)	–40°C (–40°F)
T4	+120°C (+248°F)	–40°C (–40°F)
T3	+130°C (+266°F)	–40°C (–40°F)

T0807.EPS

Ambient Temp.: –40°C to +60°C (–40°F to +140°F)

(Remote Flowtube)
For CSA C22.2 Series

Explosion proof for Class I, Division 1, Group A, B, C, & D.
Dust-ignition proof for Class II/III, Division 1, Group E, F & G.
Intrinsically safe (electrodes) for Class I, Division 1, Group A, B, C, & D.
“SEAL ALL CONDUITS WITHIN 50 cm OF THE ENCLOSURE”
“WHEN INSTALLED IN DIV. 2, SEALS NOT REQUIRED”
Excitation Circuit: 170V max
Enclosure: Type 4X
Temperature Code:

Temperature Code	Maximum Process Temperature	Minimum Process Temperature
T6	+70°C (+158°F)	–40°C (–40°F)
T5	+85°C (+185°F)	–40°C (–40°F)
T4	+120°C (+248°F)	–40°C (–40°F)
T3	+150°C (+302°F)	–40°C (–40°F)

T28-1.EPS

Ambient Temp.: –40°C to +60°C (–40°F to +140°F)

For CSA E79 Series

Flame proof for Zone 1, Ex dme [ia] IIC T6...T3
Intrinsically safe (electrodes) for Zone 0,Ex ia IIC T6...T3
Excitation Circuit: 170V max
Enclosure: Type 4X
Temperature Code:

Temperature Code	Maximum Process Temperature	Minimum Process Temperature
T6	+70°C (+158°F)	–40°C (–40°F)
T5	+85°C (+185°F)	–40°C (–40°F)
T4	+120°C (+248°F)	–40°C (–40°F)
T3	+150°C (+302°F)	–40°C (–40°F)

T0808.EPS

Ambient Temp.: –40°C to +60°C (–40°F to +140°F)

(2) Installation

For CSA C22.2 Series

WARNING

- All wiring shall comply with Canadian Electrical Code Part I and Local Electrical Codes.
- In hazardous location, wiring shall be in conduit as shown in Figure 8.3.1.

WARNING : SEAL ALL CONDUITS WITHIN 50cm OF THE ENCLOSURE'.
UN SCELLEMENT DOIT ÉTRE INSTALLÉ À MOINS DE 50cm DU BOÎTIER.

- When installed in Division 2, “SEALS NOT REQUIRED”

For CSA E79 Series

WARNING

- All wiring shall comply with local installation requirements and local electrical code.
- In hazadous locations, the cable entry devices shall be of a certified flame proof type, suitable for the conditions of use and correctly installed.
- Unused apertures shall be closed with suitable flame proof certified blanking elements. (The plug attached is flame proof certified.)

(3) Operation

For CSA C22.2 Series

WARNING

WARNING : OPEN CIRCUIT BEFORE REMOVING COVER.
OUVRIR LE CIRCUIT AVANT D'ENLEVER LE COUVERCLE.

- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous locations.

For CSA E79 Series

(Integral Flowmeter)

WARNING

WARNING : AFTER DE-ENERGIZING, DELAY 20 MINUTES BEFORE OPENING.
APRÉS POWER-OFF, ATTENDRE 20 MINUTES AVANT D'OUVRIR.

- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous locations.

(Remote Flowtube)

WARNING

WARNING : DE-ENERGIZE BEFORE OPENING.
OUVRIR LE CIRCUIT AVANT D'ENLEVER LE COUVERCLE.

- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous locations.

(4) Maintenance and Repair

WARNING

The instrument modification or parts replacement by other than authorized representative of YOKOGAWA Electric Corporation or YOKOGAWA Corporation of AMERICA is prohibited and will void Canadian Standards Explosionproof Certification.

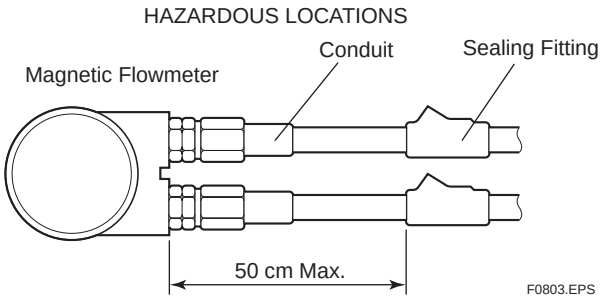


Figure 8.3.1 Conduit Wiring

8.4 IECEx

WARNING

Only trained persons use this instrument in industrial locations.

(1) Technical Data

*AXF002C – AXF400C
Applicable Standard:
IEC60079-0: 2004, IEC60079-1: 2003,
IEC60079-7: 2001, IEC60079-11: 1999,
IEC60079-18: 2004,
IEC61241-0: 2004, IEC61241-1: 2004,
IEC60529: 1999 + Edition 2.1: 2001
Certificate: IECEx KEM 05.0018

(Integral Flowmeter)
IECEx Flameproof Type
Ex demb[ia] IIC T6...T3
Electrode Circuit Um: 250 Vac/dc
Maximum Power Supply Voltage: 250 Vac/130 Vdc
Excitation Circuit: 140V max
Enclosure: IP66, IP67
Temperature Class:

Temperature Class	Process Temperature
T6	–40°C to +70°C (–40°F to +158°F)
T5	–40°C to +85°C (–40°F to +185°F)
T4	–40°C to +120°C (–40°F to +248°F)
T3	–40°C to +130°C (–40°F to +266°F)

T0809.EPS

Ambient Temp.:
PFA Lining; –40 °C to +60 °C (–40 °F to +140 °F)
Ceramics Lining; –15 °C to +60 °C (+5 °F to +140 °F)

IECEx Type of Protection "Dust"

Ex tD A21 IP6x T95½C, T105½C, T120½C, T130½C
Electrode Circuit Um: 250 Vac/dc
Maximum Power Supply Voltage: 250 Vac/130 Vdc
Excitation Circuit: 140V max
Enclosure: IP66, IP67
Maximum surface temperature:

Maximum Surface Temperature	Process Temperature
T95°C (+203°F)	–40°C to +70°C (–40°F to +158°F)
T105°C (+221°F)	–40°C to +85°C (–40°F to +185°F)
T120°C (+248°F)	–40°C to +120°C (–40°F to +248°F)
T130°C (+266°F)	–40°C to +130°C (–40°F to +266°F)

T0810.EPS

Ambient Temp.:
PFA Lining: –40 °C to +60 °C (–40 °F to +140 °F)
Ceramics Lining: –15 °C to +60 °C (+5 °F to+140°F)

(Remote Flowtube)
IECEx Flameproof Type

Ex demb[ia] IIC T6...T3
Electrode Circuit Um: 250 Vac/dc
Excitation Circuit: 170V max
Enclosure: IP66, IP67
Temperature Class:

Temperature Class	Process Temperature
T6	–40°C to +70°C (–40°F to +158°F)
T5	–40°C to +85°C (–40°F to +185°F)
T4	–40°C to +120°C (–40°F to +248°F)
T3	–40°C to +150°C (–40°F to +302°F)

T0811.EPS

Ambient Temp.:
PFA Lining: –40 °C to +60 °C (–40 °F to +140 °F)
Ceramics Lining: –15 °C to +60 °C (+5 °F to+140°F)

IECEx Type of Protection "Dust"

Ex tD A21 IP6x T95½C, T105½C, T120½C, T135½C
Electrode Circuit Um: 250 Vac/dc
Excitation Circuit: 170V max
Enclosure: IP66, IP67
Maximum Surface Temperature:

Maximum Surface Temperature	Process Temperature
T95°C (+203°F)	–40°C to +70°C (–40°F to +158°F)
T105°C (+221°F)	–40°C to +85°C (–40°F to +185°F)
T120°C (+248°F)	–40°C to +120°C (–40°F to +248°F)
T135°C (+275°F)	–40°C to +150°C (–40°F to +302°F)

T0812.EPS

Ambient Temp.:
PFA Lining: –40 °C to +60 °C (–40 °F to +140 °F)
Ceramics Lining: –15 °C to +60 °C (+5 °F to+140°F)

(2) Installation

WARNING

- All wiring shall comply with local installation requirements and local electrical code.
- In hazardous locations, the cable entry devices shall be of a certified IECEx flameproof type, suitable for the conditions of use and correctly installed.
- Unused apertures shall be closed with suitable flameproof certified blanking elements. (The plug attached is certified as the flameproof and IP66 or IP67 as a part of this apparatus.)
- In case of ANSI 1/2 NPT plug, ANSI hexagonal wrench should be applied to screw in.

(3) Operation

(Integral Flowmeter)

WARNING

- After de-energizing, delay 20 minutes before opening.
- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous locations.

(Remote Flowtube)

WARNING

- De-energize before opening.
- Take care not to generate mechanical spark when access to the instrument and peripheral devices in hazardous locations.

(4) Maintenance and Repair

WARNING

The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void the certification.

IM 01R20D01-01E-E 3rd edition is based on IM 01E20D01-01E up to 7th edition.

YOKOGAWA HEADQUARTERS
9-32, Nakacho 2-chome,
Musashinoshi
Tokyo 180
Japan
Tel. (81)-422-52-5535
Fax (81)-422-55-1202
E-mail: webinfo@mls.yokogawa.co.jp
www.yokogawa.com

YOKOGAWA CORPORATION OF AMERICA
2 Dart Road
Newnan GA 30265
United States
Tel. (1)-770-253-7000
Fax (1)-770-251-2088
E-mail: info@yca.com
www.yca.com

YOKOGAWA EUROPE B.V.
Databankweg 20
3821 AL AMERSFOORT
The Netherlands
Tel. +31-33-4641 611
Fax +31-33-4641 610
E-mail: info@nl.yokogawa.com
www.yokogawa.com/eu

YOKOGAWA ELECTRIC ASIA Pte. Ltd.
5 Bedok South Road
Singapore 469270
Singapore
Tel. (65)-241-9933
Fax (65)-241-2606
E-mail: webinfo@yas.com.sg
www.yokogawa.com.sg

Yokogawa has an extensive sales and distribution network.
Please refer to the European web-site (www.yokogawa-europe.com) to contact your nearest representative.

Manufactured by:
Yokogawa Electric Corporation
2-9-32 Nakacho
Musashino-Shi; Tokio 180
Japan

or

Produced by :
RotaYokogawa
Rheinstr. 8
D-79664 Wehr
Germany

YOKOGAWA

IM 01R20D01-01E-E
3rd edition Nov. 2006